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ALEXANDER DOUGALL BLACKADER

M.A., M.D., LL.D., M.R.C.S., F.R.C.P.(C.)

WE regret to have to record the death of Dr. Alexander Dougall Blackader, Editor-emeritus of this *Journal*, which occurred on March 14, 1932. Doctor Blackader was a leader in the profession and passed away in the fullness of years and honour. His reputation stood high in Canada and beyond, particularly in England, where he spent some of his earlier years. The widespread regard in which he was held was emphasized by a signal honour which was conferred upon him at the memorable meeting of the British Medical Association in Winnipeg in 1930, when he was inducted as one of the Vice-presidents. He is survived by his wife, formerly Miss K. E. Skelton; one daughter, Mrs. J. Colin Kemp; three brothers, Messrs. W. B. and Louis Blackader, and Dr. Edward Blackader; and one sister, Miss Alice Blackader.

Doctor Blackader was born in Montreal in 1847, the son of Francis Fraser Blackader and Margaret Pringle Drummond. Many of his early years were spent in Ontario, where he received his preliminary education in the high schools of St. Thomas and Brantford. After the completion of these studies he spent three years as an assistant in a chemist's shop. In 1866 he entered McGill University. He graduated in Arts, with first class honours in 1870 (proceeding M.A. in 1918), and in Medicine in 1871 (M.D., C.M.). Owing to ill health on graduation he accepted the position of surgeon on one of the Allan Line steamships, and then, after a year, a similar one on the Royal Mail steamers running to South America and Chinese ports. Several years were then spent in post-graduate study in England, at St. Thomas's Hospital and elsewhere, during which period he obtained the diploma of L.R.C.P., M.R.C.S. (1875). While in London Doctor Blackader served as Acting Resident Physician, Royal Pimlico Dispensary, Clinical Assistant to the Royal South London Ophthalmic Hospital, Resident Clinical Assistant to the Brompton Consumption Hospital, and, for four months, acting Resident Physician to the Great Ormond Street Hospital for Sick Children. Later in life he pursued professional studies in Prague and Vienna. Among the colourful incidents of his youthful days, while yet a medical student, was his service as assistant surgeon to the Montreal Garrison Artillery during the Fenian Raid of 1870. Being stationed at Huntingdon, Que., the young medical officer, during a lull in the proceedings drove over with his senior in a buggy to Malone, N.Y., and brought back valuable information as to the disposition of the enemy. In due course he received the Army Medal for his service, of which he was very proud.

Doctor Blackader began to practise in Montreal in 1877, and early manifested an interest in children, in the study of whose diseases he was destined to attain great distinction. He soon became attached to various hospitals, becoming physician to the Montreal General Hospital in 1885. He also became consulting physician to the Protestant Infants' Home, the Montreal Dispensary, the Montreal Foundling and Babies' Hospital (1887), and President of the Medical Board of the Alexandra Hospital for Infectious Diseases.

Doctor Blackader was one of the first on this continent to insist that diseases of children

were important enough and characteristic enough to be recognized as a specialty. Gradually this view gained ground, and he initiated the first pædiatric clinic in Canada, at the Montreal General Hospital, only two or three months after one had been started in New York. He had previously opened an extra-mural out-door clinic for children in a private room near the Maternity Hospital (1880). Also, in association with Drs. Forscheimer, Holt, Jacobi, Rotch, and a few others, he helped to found the American Pediatric Society. In June, 1930, this Society presented him with a sterling silver tray, with "sincere affection and grateful appreciation of his fellow members," in recognition of his services as a Founder Member. Doctor Blackader became Lecturer in Pædiatrics at McGill University in 1883 and Professor of Therapeutics and Pharmacology in 1891, which offices he held until 1921, when he became Emeritus Professor, receiving the honorary degree of Doctor of Laws in the same year on the occasion of the celebration of the centenary of the University.

Chief among the varied offices held by Dr. Blackader were the following:— Charter Member of the American Pediatric Association (1889); President in 1893, Emeritus Member; President, Therapeutical Association in 1911, Emeritus Member; President, Climatological Association, 1912; First President, Canadian Society for the Study of Diseases in Children (1922), (elected an Honorary Member later); President, Montreal Medico-Chirurgical Society, 1895; Honorary Member, British Pædiatric Association, 1929; Vice-president, British Medical Association, 1930; Emeritus Member, Association of American Physicians, 1916; President, Canadian Medical Association, 1917; President, Alexandra Hospital for Infectious Diseases; Editor, Canadian Medical Association Journal, 1921; Life Member, Canadian Medical Association, 1924; Medical Adviser to the Bank of Montreal and the Royal Trust Co.; President, University Club of Montreal, 1915; Member of Canadian Club of Montreal; Royal Montreal Golf Club, and the Authors' Club, of London.

Doctor Blackader's contributions to various text-books, systems, and journals on subjects connected with his specialty were numerous and important. Among them are articles in Keating's Cyclopædia of the Diseases of Children, the Reference Handbook of the Medical Sciences, and Forscheimer's System of Therapeutics of Internal Diseases.

An unusual and well-merited honour was conferred upon him in the establishment by the Canadian Medical Association, during his lifetime, of the "Blackader Lectureship in Diseases of Children," "as a tangible expression of deep and abiding appreciation of Dr. Blackader's efforts, as a mark of recognition also of his eighty-second birthday, and, finally, to signalize his pioneer and long-sustained interest in the field of diseases in children, and his devotion to the highest ideals in Medicine." This was in 1929. Dr. Blackader was keenly appreciative of this recognition and it was with great regret that he found himself unable, on account of the state of his health, to be present in Vancouver when the first Lecture was delivered by Dr. Edwards A. Park, of Johns Hopkins University. In a letter to the President, Dr. A. S. Monro, which was read on that notable occasion, he expressed himself thus, in part:— "Will you permit me to take advantage of the present opportunity, probably my last, to express again through you my appreciation of the honour conferred on me by the foundation of this lectureship, the first one of which I am aware to be established on the subject of pædiatrics by any national medical association. Permit me also to add that my work as editor of the *Journal* of the Association during the ten years, 1919 to 1929, for which this honour was conferred upon me, was always a labour of love, and the very generous recognition of it in this notable way took me entirely by surprise. Especially am I grateful for the selection of pædiatrics as the subject for the lectureship."

Dr. Blackader's connection with medical journalism dates back many years, as he took part in the resuscitation of the *Montreal Medical and Surgical Journal* and became in 1895 one of the editors of the *Montreal Medical Journal*, as it became, now submerged in the *Canadian Medical Association Journal*. Our *Journal*, started in 1911 as the official organ of the Canadian Medical

Association, was at first under the able editorship of Sir Andrew Macphail. During the period of the war, when the Editor was on active service, its interests were in the hands of Drs. Gordon Campbell and Maude E. Abbott, as acting editors, and when, after his return, Sir Andrew felt compelled to resign the editorship owing to a regrettable disability of his eyesight, the *Journal* was placed in charge of a committee (1919) of which Dr. Blackader acted as chairman. After two years Dr. Blackader assumed the chief editorship and set himself with great industry and devotion to build up the *Journal* on broader lines. For, up to this point, the *Journal*, while a worthy expression of Canadian Medicine, had, it must be admitted, by no means a general appeal. Dr. Blackader set himself to broaden its appeal. In season and out of season he was insistent that the *Journal* was the concern of each Province; that, as the official organ of the Association, it should be not sectional, or even provincial, but national in its scope. This idea, thoroughly desirable, gradually gained favour, and before Dr. Blackader demitted his editorship he had the gratification of seeing the establishment of provincial editorial committees, supporting the national journal and that journal accepted as the official organ of the various provincial medical associations. This was a great step forward.

But Dr. Blackader thought imperially as well as nationally, and did much to interest our medical brethren in Great Britain in Canadian Medicine, and not a few from abroad have contributed to our pages. This result, too, was much facilitated by the eventual affiliation of the British and Canadian Medical Associations, which happy result followed on a visit to Canada of Sir Jenner Verrall and Dr. Alfred Cox in 1924, and the closer relations that then became possible between the journals of the two bodies. Furthermore, Dr. Blackader's ready pen and critical acumen enabled him to produce editorial matter of excellent quality. He was always on the alert to capture some new thought or movement in medicine and in this way kept the *Journal* up to date. Besides this, his courtesy and tact enabled him to deal with difficult journalistic situations with a minimum of dysharmony. During his régime it became necessary to enlarge the *Journal*, and the present pleasing format was his idea. When he resigned the editorship-in-chief in 1929 he left the *Journal* as a going concern and in a strong position. It has never looked back, a fact testifying to the excellence of its foundations.

Many appreciations of Dr. Blackader and his work have been received at our office, some of which may be quoted here. Dr. J. G. FitzGerald, Dean of the Medical Faculty of the University of Toronto, and Director of the Connaught Laboratories, wired as follows:—

"Faculty of Medicine, School of Hygiene and Connaught Laboratory, University of Toronto, send deepest sympathy on death of Dr. Blackader."

Dr. Alfred Cox, Medical Secretary of the British Medical Association, wrote:—

"Dear Dr. Nicholls,— I have just seen in the *Times* the report of the death of your predecessor and I should like to offer to you and to the members of your staff, and to those who worked with our old friend, my sincere sympathy. He was a man whose work for the profession in Canada cannot be over-estimated—on that side there are many who can speak better than I can, but he was also a man who must have influenced by his personality many people, as he did me. For many years I had regarded him as a dear and close friend who often sent me encouraging messages, and he was one of the most welcome visitors to this office. He was such a fine example of courage and steadfastness. The last time I saw him he was in bed at Winnipeg, where he had gone with the full intention of participating in our Annual Meeting and where he was laid aside by a very painful illness. The way in which he endured what must have been a cruel disappointment was wonderful. Our Association has lost a valued Vice-president and a very good friend."

At a meeting of the Board of Governors of McGill University, held on April 4th, the following minute was adopted:—

"Resolved: That the Governors of McGill University express in their minutes their deep regret in the death of Dr. Alexander D. Blackader, Emeritus Professor of Pharmacology, Therapeutics and Pædiatrics. They would record their gratitude for his long and faithful service to this university as teacher, counsellor and friend. Dean of his profession and eminent in his field throughout his long and distinguished career he brought to his daily tasks the highest sense of the responsibilities and the ethics of his calling. With an unflagging industry and a buoyant optimism which remained

undaunted all his days he toiled always for the healing and happiness of mankind. In his death the members of the governing board mourn the passing of a devoted servant and a genial companion whose ministrations have blessed the lives of multitudes and whose gentleness and simplicity splendidly adorned the spirit of all his labour.''

As Chairman of Council it is my privilege to attempt to express on behalf of the members of the Association the great sorrow felt at the passing of Dr. Blackader, and in feeble measure the grateful appreciation of the services he so ably and so unselfishly rendered the Association. His contribution of ten years' devotion to the *Journal* as Editor was so remarkable that oft-repeated thanks have been expressed at the annual meetings of Council—but such expressions lose nothing in reiteration.

During the War the Association and its journal fell upon lean years. Many were away, and those who remained in Canada were fully occupied with more pressing duties. In 1919 there was even talk of abandoning both projects. In October, 1919, Dr. Blackader, then 72 years of age, offered his services gratuitously as Chairman of the Editorial Committee of the Journal. He surrounded himself with a committee who could not be otherwise than active and zealous because of his example. To all intents and purposes he made the Editor's post a full-time job, sacrificing comfort, sleep, pleasure, and vacation to the development of ''his journal.'' And he ''carried on'' with increasing physical difficulty for ten long years. And at the Montreal meeting in 1929, unable because of acute illness to attend, he wrote his resignation. But his interest did not wane. Released from time-consuming routine duties he devoted himself to reviewing and abstracting many difficult and abstruse subjects and presenting them in the *Journal* as editorials or retrospects. No more will the familiar initials 'A.D.B.' start from its pages!

May I, from intimate personal knowledge, tell our members how proud he was of the action of Council in founding the Blackader Lecture in Diseases of Children, how pleased to receive through them the Honorary Vice-presidency of the British Medical Association. He looked upon those honours as a mark of misplaced affection rather than a token of deserved esteem.

But behind the knowledge, the erudition, the industry, lay *the man*. Great-hearted, the soul of professional ethics, loyal to his friends, charitable to all. Helpful to his colleagues and especially so to the younger, and perhaps struggling, members of the profession. Ever ready to respond to a call for assistance, but averse to receiving a fee if the appearance of the household suggested the need of economy. ''My dear woman, keep that to buy medicine for the baby'' was his kindly formula of refusal.

Such were the experiences of the younger generation of physicians practising in Montreal in the '90's and later. To them he was a true friend and an inspiring example. To his patients, rich and poor, hospital and private, he was a great physician.

A. T. BAZIN,
Montreal.

Of the many eminent Canadian physicians scattered under the shadow of death in the present generation, few will have more reason than A. D. Blackader for enrolment in the Hall of Fame—he was *ultimus Romanorum*. There can be no reasonable regret over the passing of so long a life, filled to the brim with useful work, a career honourable and honoured—one that coincided with five decades of progress in the McGill Medical School, in which he played so conspicuous a part. He had so much in him of the best of the Romans—dauntless courage, unflagging industry, and abiding faith.

The monument of such as he is the sum total of his work, not alone his pioneer efforts in pædiatrics, pharmacology and journalism, but the influence and the constructive policies which have left their impress on our faculties, our hospitals and in the community. He was a part of Canada's glory, serving her without thought of himself, without limit or reservation, equally in all things.

Dr. Blackader was not what one would call a man of genius; rather, let us say, a man of unusual quantity and quality of talent, and yet he had a genius for exact and strenuous work. Others will speak of his professional achievements, of his brilliant work in late life as an editor, of his scrupulous care in editing each individual article, jealous of its literary quality, merciless in tracking down faulty references and ill-chosen words, and of his querulous, half humourous letters to contributors on the sin of careless writing. Suffice it to say that through his efforts alone the *Canadian Medical Association Journal* has received a well merited reputation throughout the medical world. In no other connection, perhaps, were his characteristics of conscientiousness, patience and industry more evident. He was utterly devoid of ostentation and personal ambition, and imposed upon himself this extra work because he knew that it needed doing; and so he devoted himself to it with

unflinching courage in the face of persistent ill-health. His intimate friends will recall with especial affection his generosity to the younger men, especially the more impecunious. There was never a function at which he did not look around for some unfortunate younger colleague, who for lack of means was unable to attend a banquet, and many a ticket was sent to such a man anonymously.

His cheery optimism—whether in the matter of the efficacy of drugs, or his prowess on the golf links—his genial companionship and discursive talk about the festive board will always be remembered. If at times irascible, in his early years, at some contravention in others of what he regarded as the ideals and principles of his profession, he, nevertheless, always—"carried anger as the flint bears fire, which being much enforced, shows a hasty spark, and straight is cool again." Like good wine, he mellowed with age, and his progressively increasing gentleness and tolerance was the subject of admiration amongst his many friends and colleagues. The loss of his only son during the Great War, his disability over many years through ill-health left him unembittered, and those who saw him work and knew the difficulties that successively faced him found that they never crushed his courage or resolution. His memory is enshrined in the respect and appreciation of his associates, for he was able to bear success with humility, the affection of his friends without pride, and to be ready when the day of sorrow and grief came to meet it with courage befitting a man.

Few of us will forget the inspiration derived from his courage at the Winnipeg meeting of the British Medical Association, when, though obliged to be taken in a wheeled chair from his hotel to the platform of the auditorium, he received the Vice-presidency of that body. He stood with head erect, the embodiment of the noble, old man that he was.

His mental faculties were entire and alert to the end. Colleagues and citizens alike will be the better for thinking of that honourable, full and well-spent life of a courteous, upright gentleman true to his old friends and faiths.

C. F. MARTIN,
Dean of the Faculty of Medicine,
McGill University.

The news of the death of Dr. Blackader came as a great blow to his many friends throughout the Dominion and beyond. Few men were better known, better loved, and more respected than he, and it seems hard to believe that we will see him no more in our gatherings. But time must tell and he has gone to his rest.

To a large clientèle Dr. Blackader was always the friend as well as the beloved physician, and many generations of students, some of whom are now senior members of the profession, recall with love their old teacher, and remember the sound instruction that he gave them, upon which so much of their after success has been founded.

It was perhaps as Editor of the *Canadian Medical Association Journal* that Dr. Blackader became best known, and the tireless energy with which he worked here soon made this one of the outstanding journals of the world. Dr. Blackader was a constant attendant at various medical society meetings and the keen interest that he showed in all scientific advances helped to make these meetings a success. All will remember the happy, almost wistful, smile, and the hearty grasp of the hand with which he welcomed his friends, and these were a legion, for everyone seemed to know and relish meeting the charming veteran.

I first came much in contact with him nearly thirty years ago when we were associated in the initiation of the Patent and Proprietary Medicine Act. The advisory board was soon enlarged to four members and in our frequent meetings and constant correspondence we learned to appreciate his keen mind and sound judgment, and he will be much missed in this work.

In recent years Dr. Blackader's health was in a precarious state, but he always rose superior to his disabilities and nothing seemed to damp the ardor of his interest in things medical or to interfere with his power for work. The death of his only and very brilliant son on active service overseas was a terrible blow, but, in spite of this, he carried on, and, like many another, refused to let his sorrow mar his life's work.

Dr. Blackader is now at rest and, while thinking of him and of all that he did for the good of mankind and his loved profession, the old words come to mind

"Well done thou good and faithful servant."

R. D. RUDOLF,
Toronto.

Through a friendship extending over thirty years the writer came to know much about the personality and the scientific and intellectual interests of the late Dr. Blackader. In the earlier years of his life he must have been very keen in his interests in many subjects, for these same interests, as they were exemplified in his last thirty

years, could not have otherwise attained the keenness which he manifested in so many lines of activity. Ability he had of a high order, and this would have caused him to excel to a certain extent in achievement, but there was also "the fire on the high altar" from whence came the force that directed his intellectual life. He won a noted standing as a teacher of pædiatrics, pharmacology and therapeutics, but his interests extended to subjects quite outside the professional line. It was indeed very rare, as the writer experienced in many a conversation with him, to find him uninterested in any topics concerned in advances in science, archæology, and in certain phases of philosophical thought. He did not claim to have any profound knowledge of these subjects but they appealed to him as worthy of his keen interest. Indeed, had the early opportunities of his life permitted, he might have entered on a career in a purely scientific or scholastic line in which he would have achieved greater distinction than he did in medicine, special as that was. Life brought him sorrow but he met it with a stoicism of the ideal type. He pursued his tasks to the very end and found therein a consolation for untoward awards of the Fates. He "followed the Gleam." An idealist, though because of his experience of life a chastened one, a gentleman, kindly, unselfish, tolerant of human weakness and error, he will remain a sacred memory to those who knew him intimately. *Ave et vale!*

A. B. MACALLUM,
London, Ont.

News of the death of Dr. Blackader has come as a sore blow to all his old students and associates in the Medical School of McGill and especially to any who could look back on years of friendship. We all knew Dr. Blackader was no ordinary man. Perhaps one of the first things that comes to us in our loss is the genius for friendship which he possessed. I can speak feelingly on this, for while I only met Dr. Blackader on fleeting visits to Montreal and did not have the privilege of prolonged interviews with him, I always made it a point to call on him and I gradually found that in almost all subjects we thought alike, medical education, medical politics, medical literature, and we also agreed in dealing with the personal characters of those who guided or would guide the destinies of the profession. After this impression of a true and intimate friendship, perhaps the most outstanding feature of Dr. Blackader was the emphatic straightforwardness of his character in his teaching, in his contacts with his students and with those who consulted him professionally. Another outstanding feature of Dr. Blackader was his sympathy with all motions and impulses which came to his attention as a teacher and editor, and which made for the best and truest developments in the character of our profession.

The last time I saw him was on September 15th last. It was early in the forenoon, but he was at his desk in his study. He was speaking of Lady Osler. He seemed to think that our Association had not taken as much notice of her as we should, especially thinking of her care and help to Sir William in those last sad days. I think he was writing a paragraph on the subject.

Dr. Blackader liked to get a few friends together. I have a memory of a little dinner he gave in my honour in the dining room at the University Club. There are many who will recall such little gatherings and the cheerful host. We can see the grave, earnest face lit up at times by some happy recollection. He had a wonderful memory, not only for the articles in weekly or monthly papers but for the writings of the leaders in our work in former generations. One seldom came away from such meetings or an "afternoon tea" without feeling he had learned a great deal.

I am now at an age when all my old friends are quickly passing from my hands and eyes, and, even, as Time moves on inexorably, from my Memory, but not from my thoughts. I see them disappear into the Unseen, but I think as old Vaughan thought:

"They all are gone into the world of light,
And I alone sit ling'ring here . .
Mine very memory is fair and bright,
And my sad thoughts doth clear . .
I see them walking in an air of glory."

JOHN STEWART,
Halifax, N.S.

RENAL INSUFFICIENCY IN ESSENTIAL HYPERTENSION*

BY LENNOX G. BELL, M.D., M.R.C.P.,

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PHYSIOLOGISTS have laid down a principle which should preface every discussion on high blood pressure, namely, that hypertension, like fever, is a *symptom* and *not a disease*. This precept enables us at once to separate off from the group of hypertensive states all cases of known etiology. For example, we know that hypertension may occur as a symptom in the following pathological conditions:— diffuse glomerulo-nephritis; polycystic disease of the kidneys; complete urinary obstruction; certain cases of widespread destruction of the renal parenchyma by such necrotising agents as corrosive sublimate, or by pyogenic infection; certain cases of lead poisoning; the toxæmia of pregnancy; certain adrenal tumours; and as a compensatory mechanism in increased intracranial pressure and asphyxia. When all such possibilities have been eliminated, there still remains that great group of cases which we designate as essential hypertension — a term which is obviously a confession of our complete ignorance of the underlying cause.

The limited scope of this paper precludes any discussion of the etiology of essential hypertension, for such a discussion merely leads into a morass of speculative uncertainty. But, whatever the underlying causative factors may be, it seems probable that the pressor effect is initiated and maintained by means of a widespread vaso-constriction, and that, sooner or later, certain organic vascular changes occur secondary to the prolonged hypertension. These changes affect the arterioles of certain organs and we therefore designate them by the term "arteriolosclerosis", in contradistinction to the atherosclerotic changes which affect the larger arteries and which are not necessarily associated with an elevated blood pressure.

Arteriolosclerosis affects first the smallest arteries, such as the afferent arterioles of the kidneys. Here, the initial change is a deposition of hyaline material directly under the endothelium, and as this process of hyaline degeneration advances, the lumen of the vessel becomes narrowed and finally occluded. In the larger arterioles the first change consists of a reduplication of the internal elastic lamina, followed by a proliferation and degeneration of the intima, with consequent occlusion of the vessel. The media sometimes undergoes an early hypertrophy, but later there is a gradual atrophy of the muscle with replacement fibrosis.

The distribution of these arteriolar changes in the various organs is very characteristic. The kidneys are almost invariably affected, and it is here that we usually find the most severe lesions. The spleen, pancreas, liver, retina and brain are involved in a considerable proportion of cases, while the terminal arterioles of the skin, lungs, gastro-intestinal tract and thyroid are very rarely affected. It has been shown recently by Kernohan, Anderson and Keith[1] that in those cases which run a malignant course the arterioles of voluntary muscle exhibit a medial hypertrophy, while in the majority, which constitute the benign type, these vessels show no change.

In the autopsy material obtained from 52 cases dying of essential hypertension which formed the basis of study for this paper, the distribution of arteriolar change was as follows:

TABLE I

Organ	*No. of Cases*	*Percentage*
Kidneys	52	100
Spleen	24	47
Pancreas	20	38
Liver	9	17
Brain	8	15
Pectoralis major	4	7

* From the Department of Medicine, University of Manitoba, and read before the Annual Meeting of the Manitoba Medical Association, Brandon, September 8, 1931.

It will be seen from these figures that the kidneys were involved in every instance, although only 9 cases showed evidences of renal insufficiency. The striking fact that the vascular changes in essential hypertension involve only a small proportion of the terminal arterioles effectively disproves the theory that hypertension is caused by a structural narrowing of the vessels.

Clinically, essential hypertension is one of the most common conditions met with in practice. It is also one of the most protean of diseases in mode of onset, in symptomatology and in termination. On the one hand, it may run a chronic, asymptomatic and essentially benign course over a period of many years, death ensuing from some entirely unrelated cause, while, on the other hand, the condition may pursue a fulminant and truly malignant course, ending fatally within a few months of the onset. Between these two extremes one finds cases which exhibit every gradation of severity and the most varied symptomatology. In the great majority of cases of essential hypertension, death results from cardiac failure or some cerebral vascular accident, and renal function rarely becomes seriously impaired. In the present series of cases, the cause of death was as follows:—

TABLE II

Cause of Death	*Numbers*		*Percentage*
Congestive heart failure	21	25	48
Coronary thrombosis	4		
Cerebral hæmorrhage	14	17	34
Cerebral thrombosis	3		
Heart failure with renal insufficiency	3		4
Renal insufficiency with uræmia	7		13

(These figures are not strictly accurate as they do not include any instances of essential hypertension in which death occurred from some unrelated cause. They show the relative incidence of the several modes of termination, where death is directly due to the effects of essential hypertension.)

It will be seen from these figures that, in a small proportion of cases, renal insufficiency does occur and death ensues from uræmia. It is this small but important group that I propose to deal with particularly in this paper. The instances of renal insufficiency developing in the course of essential hypertension can be divided into two general types:—

1. Those cases in which the arteriolosclerosis common to the majority of instances of essential hypertension has proceeded to such an extent that the major portion of the renal parenchyma has been slowly obliterated. The essential histological lesion in such cases is a gradual thickening and obliteration of the interlobular arteries and afferent arterioles, leading to hyalinization of the glomeruli supplied by the damaged arterioles. When three-fourths of the functional units of both kidneys have been destroyed in this way, renal insufficiency will supervene. The gross appearance of the kidney in such cases will vary with the rapidity of the arteriolar change, but usually the organ will be shrunken and present a granular appearance. Such a kidney may be termed primary contracted kidney, benign decompensated nephrosclerosis, or the decompensated phase of benign arteriolosclerosis (Fishberg[2]).

In a few cases (3 in this series) the renal sclerosis is not advanced enough to produce kidney insufficiency so long as the heart remains well compensated. When heart failure ensues, however, the damaged kidney can no longer deal with the waste products of the body and renal insufficiency occurs as a complication.

2. The second general type includes those cases of essential hypertension which exhibit rapid renal insufficiency with no marked atrophy of the kidney. To this group the term "malignant nephrosclerosis" was applied by Fahr,[3] who demonstrated that, in addition to the arteriolosclerosis present in nearly all cases of essential hypertension, there is also severe necrosis of the renal arterioles with certain secondary changes in the glomeruli. These glomerular changes were at first considered by Volhard and Fahr to be inflammatory in nature—an acute glomerulo-nephritis engrafted on a previously arteriolosclerotic kidney— hence their early designation of such cases as "combination forms." It was later shown by Jores[4] and others that the glomerular lesions were merely the result of a rapid cutting down of their blood supply due to narrowing of the vasa afferentia, and Volhard and Fahr have since abandoned the inflammatory theory to explain such changes. These rapidly progressive cases have been extensively studied in recent years, and from such studies has emerged the clinical and pathological entity variously known as malignant nephrosclerosis (Fahr,[3] Klemperer and Otani,[5] etc.); malignant hypertension (Keith, Wagener and Kernohan,[6] etc.); and the

malignant phase of essential hypertension (Fishberg[2]).

Perhaps the most satisfactory term for the cases under discussion is "malignant nephrosclerosis", as many writers include under the designation "malignant hypertension" all cases which run a rapidly fatal course with extensive arteriolar involvement, whether the mode of termination is by renal failure, cerebral hæmorrhage, or cardiac decompensation. Fishberg uses the term, "the malignant phase of essential hypertension", to designate the cases which end fatally in uræmia with necrosis of the renal arterioles. His reasons for the use of this term he states as follows: "Available evidence indicates strongly that the arteriolar necrosis develops in the kidneys of patients with essential hypertension only after the hypertensive disease has been present for a longer or shorter time. In other words, necrosis of the renal arterioles with its attendant acute renal insufficiency is one of the complications of essential hypertension, as are cardiac failure or cerebral hæmorrhage, but much less frequent than the latter."

It is not clear why the injury to the renal arterioles should assume the form of a rapid necrosis in these cases. A superadded toxic factor has been suggested by Herxheimer. Fahr and others have advanced syphilis, lead, or a previous articular rheumatism as possible etiological factors, but it seems much more likely that the disease merely represents a very severe form of essential hypertension complicated by arteriolar necrosis. Loehlein[7] was the first to insist that the essential difference between benign and malignant nephrosclerosis was one of time, and this view is now generally accepted by the majority of workers on the subject. However, the etiological factors underlying this striking acceleration of the arteriolosclerotic process are yet enshrouded in the same obscurity which surrounds the entire question of the etiology of essential hypertension.

MALIGNANT NEPHROSCLEROSIS

Age.—It has been observed by all writers on the subject that the average age of patients suffering from the malignant type of hypertension is decidedly younger than in those with the benign form. The average age at death in the malignant form in the present series was 44, whereas the average in benign cases was 55.

TABLE III
AGE OF PATIENTS AT DEATH

Author	*Malignant sclerosis*	*Benign sclerosis*
Fahr	42	60
Keith, Wagener and Kernohan	33–55	—
Klemperer and Otani	39	50 plus
Present Series	44	55

Sex.—The disease seems to be equally distributed between the two sexes.

The clinical course of malignant nephrosclerosis.—In practically all cases fatal renal insufficiency is preceded by a hypertensive stage. In some instances the initial clinical picture is one of essential hypertension which may run an uncomplicated course for years and then suddenly assume the features of the malignant type with rapid renal insufficiency. In a great many cases, however, the patient is quite unaware of previous hypertension and uræmia is present at the first examination. In such cases it is difficult to judge how long hypertension has been present, as often the patient has enjoyed perfect health up until the onset of uræmia, but the finding at autopsy of a greatly hypertrophied heart usually serves to indicate that the blood pressure has been elevated for some time. Generally speaking, the terminal uræmic phase is more rapidly fatal in those patients who are unaware of a pre-existing hypertension, and the age of such patients is as a rule younger than those in the other group.

The clinical symptoms show considerable variation. The patients who pass through a previous hypertensive stage will exhibit the usual manifestations of essential hypertension. They may pass into the uræmic phase abruptly, or there may an acute exacerbation of headache, vertigo, dyspnœa, etc. In the other group, the earliest symptoms are usually an insidious weakness, with rapid loss of weight, and dyspnœa on exertion. Many patients will first complain of a gradual failure of vision for some time preceding the onset of uræmia, as it is found that a severe neuro-retinitis is a constant and often an early manifestation. The uræmic phase is ushered in by anorexia, obstinate nausea and vomiting, restlessness, and severe headache. The subsequent course is that of a rapidly fatal uræmia which progresses to its inexorable termination uninfluenced by treatment. The average duration of this terminal state is about four to six weeks from the onset of uræmic symptoms. The blood pressure is usually much elevated, a systolic pressure of 210 to 260 and

a diastolic of 120 to 150 being common findings. The heart is enlarged to the left, and this enlargement may be extreme if hypertension has been present for any length of time.

Examination of the urine reveals a specific gravity which tends to become fixed at 1010, with a rapid diminution of the concentrating power of the kidneys, as demonstrated by the water test and concentration test of Volhard, or by the phenolsulphonphthalein test. Albumin is usually present in marked amount, even before the onset of complete renal insufficiency, and the centrifuged specimen shows hyaline and granular casts and, occasionally, blood. Chemical examination of the blood reveals an increase in urea-nitrogen and creatinine, and these values rise steeply as the disease progresses to its uræmic termination. A secondary anæmia usually appears after the onset of renal insufficiency, but this is seldom so marked a feature as in chronic glomerulonephritis.

Examination of the eye-grounds is most important in this condition. In practically all cases there is a well marked neuro-retinitis with sclerosis of the small retinal arteries. These changes often antedate the onset of uræmia by weeks, months, or even years. It has been pointed out by Keith, Wagener and Kernohan, that the retinitis of malignant nephrosclerosis differs from that seen in chronic nephritis in several particulars. There is little tendency to the formation of the peripapillary "snow-bank" exudates commonly seen in nephritis; the hyperæmia of the disc contrasts sharply with the anæmia seen in nephritis, and sclerosis of the retinal arterioles is almost invariably present in malignant nephrosclerosis, whereas it is usually slight or absent in nephritis.

Pathology of malignant nephrosclerosis.—The lesions in malignant nephrosclerosis are very characteristic. First described by Fahr, important additions to the pathology of the disease have since been made by Herxheimer, Jores, Lohlein, Bell and Clawson,[8] Keith, Wagener and Kernohan, Klemperer and Otani, Shapiro,[9] etc. The kidneys in the majority of cases are very slightly reduced in size. Their surface is diffusely granular, with a few depressed areas but no gross scarring. The surface presents a mottled appearance, predominantly red-brown in colour, and scattered over the kidney are numerous petechial hæmorrhages. Sometimes these hæmorrhages are so marked that the organ resembles the "flea-bitten" kidney of subacute bacterial endocarditis. On section the cortex is not markedly shrunken or irregular, and the sharp demarcation between cortex and medulla is usually preserved. Greyish streaks are usually seen in the cortex. The medulla is generally normal.

The microscopic changes are equally striking. The predominant feature is the severe vascular damage, consisting of narrowing and obliteration of interlobular and arcuate arteries, and thickening of afferent arterioles, with frequent necrotic changes. Some of the necrotic arterioles show complete disintegration of the wall with perivascular hæmorrhage, producing the petechial hæmorrhages noted grossly, and in others the wall is permeated with red blood cells. In many cases the afferent arteriole shows a peculiar dilatation at the point where it enters the glomerulus. The glomerular changes consist in degeneration of the capillary tuft, varying from hyaline droplet degeneration to complete necrosis of many of the loops; anæmia and collapse of the tufts; and occasionally, epithelial proliferation. Secondary degeneration of the tubules is always present and varies from fatty degeneration to complete necrosis.

The heart is always markedly enlarged, the average weight being 550 g. Arteriolosclerosis is usually observed in the spleen and pancreas. Kernohan, Anderson and Keith have pointed out that medial hypertrophy in the arterioles of voluntary muscle is an almost constant finding in the malignant types of hypertension, whereas there is usually no change in the benign cases. This has suggested that a biopsy of the pectoralis major may be a valuable procedure to determine whether a case of hypertension will follow a benign or a malignant course.

The following cases have been selected from a study of the clinical and pathological material of the Winnipeg General Hospital, to illustrate some of the forms of renal insufficiency which may supervene during the course of essential hypertension.

CASE 1

A.G., Icelandic, aged 43, a farmer, was admitted to the Winnipeg General Hospital on June 9, 1931.

Past illnesses.—In 1924 he was operated on for a tumour developing in an undescended right testicle. Microscopically, this tumour appeared to be a teratoma. The left testicle was also within the abdomen. The family history was irrelevant.

Present illness.—The patient felt quite well until four months prior to admission, although for about six months he had suffered from occasional headaches which were unusual for him. However, he carried on with his work on the farm until the middle of February, when he became aware of a gradual increasing weakness. A few weeks later he noticed that he was short of breath on any unusual exertion, and this latter symptom became more and more insistent, until, on admission, he was dyspnœic even at rest. In four months he had lost some thirty pounds in weight. All the above symptoms were attributed to a goitre which had first been noticed about two years before. Two weeks before admission, his appetite failed him completely. He was nauseated after every meal and vomited, at first occasionally, but later on any attempt to take food. The nausea was not relieved by vomiting, and no abdominal pain was experienced. For several months he had been getting up twice at night to urinate, but he had had no frequency during the day.

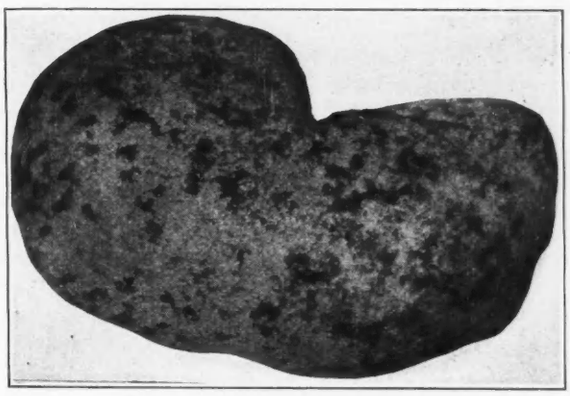

FIG. 1.—The left kidney. The organ is larger than normal due to the congenital hypoplasia of the other kidney. Note the absence of scarring; the flat granulations; the mottled appearance with numerous hæmorrhages dotted over the surface. This is the typical appearance of the kidney in malignant nephrosclerosis.

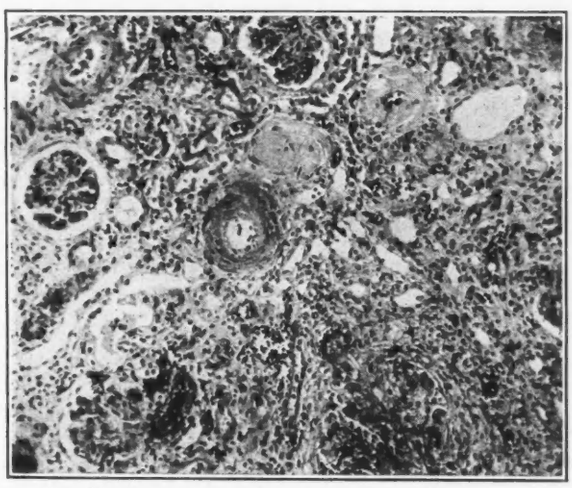

FIG. 2.—In the centre of the field two greatly thickened arcuate arteries are seen with an obliterated glomerulus between. On the left and right hand sides, two glomeruli with collapsed anæmic tufts are seen. In the lower left hand corner is a glomerulus showing a necrotic arteriole from which a small hæmorrhage has occurred. (x 100).

Physical examination.—The patient weighed 179 pounds. His skin was pale and somewhat sallow. He was very restless, tossing around in bed. The breathing was apparently Cheyne-Stokes in type at times, and he appeared dyspnœic even while lying quietly in bed. The thyroid was slightly enlarged, particularly the isthmus, but there were no adenomata present, and no thrill or bruit could be detected over the gland. The heart did not appear markedly enlarged clinically, but the apex beat was heaving in character. The aortic second sound was loud. There were no murmurs. The blood pressure was 240/150. No signs of congestive failure were present. No tremor of the outstretched hands could be detected.

On admission, the basal metabolic rate was investigated, and showed a figure of plus 36. Urinalysis showed a specific gravity of 1011 with marked albumin. The sediment contained granular and hyaline casts. Chemical examination of the blood revealed a urea nitrogen content of 199 mg.; creatinine of 10.2 mg. An examination of the fundi showed fairly marked neuroretinitis. The discs were reddened and showed papill-œdema. The surrounding retina was also œdematous. The vessels were contracted and showed moderate sclerosis. A few scattered hæmorrhages were seen.

The patient was evidently relapsing rapidly into uræmia. He remained conscious, but developed Cheyne-Stokes respirations, and became somewhat dull mentally. The urinary output fell to 550 c.c., with a specific gravity of 1010. On June 12th he suddenly developed a convulsion, and died shortly afterwards.

Autopsy findings.—The body was that of a well nourished man of 43. No œdema was present. The peripheral arteries were soft. The thyroid gland weighed 28 g. On microscopic examination it presented a normal colloid appearance. The heart weighed 700 g. It was hugely enlarged, the enlargement being entirely confined to the left ventricle. Over a small area on the anterior surface of the left ventricle, the pericardium had a glazed appearance. The auricles and the valves presented a normal appearance. The right ventricle was normal, the wall measuring 3 mm. The left ventricle was greatly hypertrophied and also dilated, its wall measuring 22 mm. The aorta was normal throughout its course, showing no atheromatous change. The coronaries were soft and patent. They showed only a few scattered patches of fatty deposits. The lungs showed marked œdema, and an old healed tuberculous lesion at the right apex. The liver and spleen were

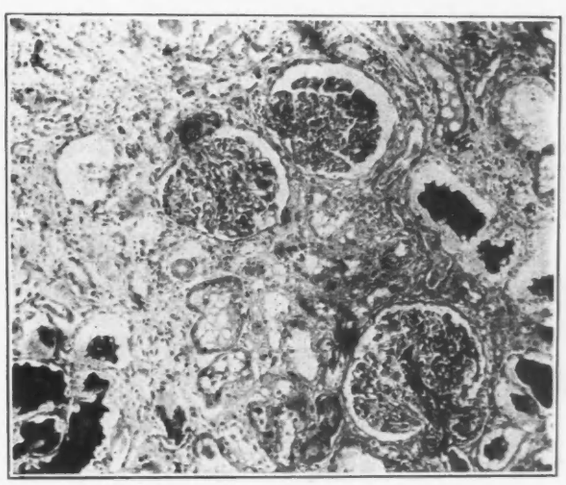

FIG. 3.—Section shows two glomeruli with necrotic arterioles and considerable degeneration of the capillary tufts. One anæmic glomerulus is seen above showing fusion of the capillary loops and patches of hyaline degeneration. (x 100).

somewhat enlarged and congested. The small arteries of the spleen were thickened.

The right kidney weighed 42 g. It was tied down by dense adhesions and was distinctly hypoplastic (probably a congenital anomaly). The organ measured 7 x 2 cm. The surface was pale and very finely granular, and presented a mottled appearance, with yellowish areas and petechiæ. The cut surface showed a pale mottled

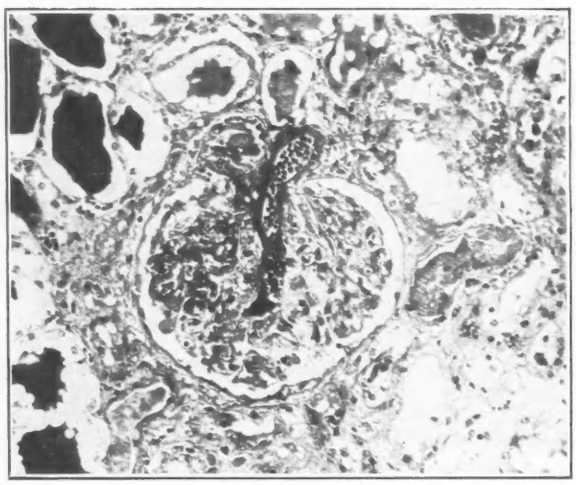

FIG. 4.—Glomerulus, showing necrosis and fusion of the loops of the tuft, and necrosis and dilatation of the afferent arteriole. (x 200).

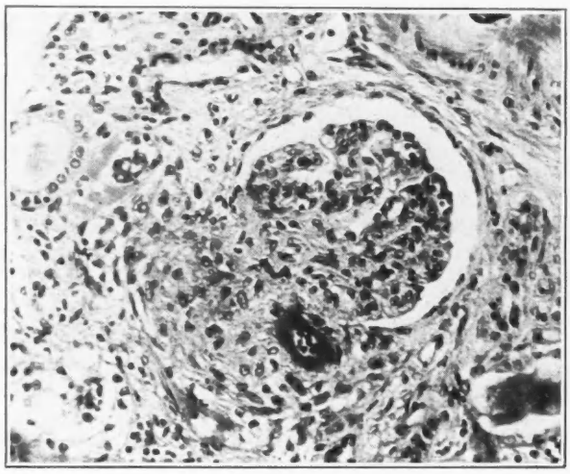

FIG. 5.—Glomerulus showing necrosis of the afferent arteriole and a peculiar area of endothelial hyperplasia. (x 200).

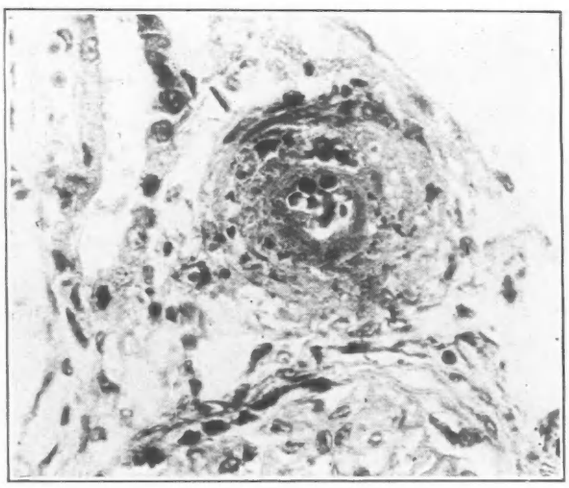

FIG. 6.—Field shows an afferent arteriole with the edge of the glomerulus below. The arteriole is thickened and necrotic. The wall is impregnated with red blood cells, and several disintegrating nuclei can be seen in the necrotic wall. (x 550).

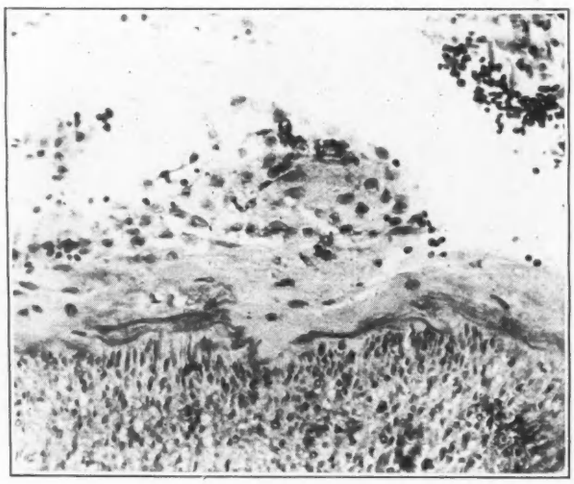

FIG. 7.—Large interlobar artery, showing extreme thickening, with endothelial hyperplasia of the intima. (x 225).

surface. The markings were obliterated and the cortex narrowed and irregular.

The left kidney was large, but the size was probably compensatory. It weighed 225 g. and measured 15 x 5.5 cm. The capsule stripped readily exposing a slightly granular and diffusely mottled surface. The general colour was brownish-red. The mottling consisted of spots of varied colour—yellow, brown and grey, with many scattered petechial hæmorrhages. There were no scars. The cut surface showed a definite distinction between cortex and medulla. The markings of the medulla were normal. The cortex was slightly irregular, measuring from 5 to 7 mm. The cortical markings were indistinct because of irregular greyish flecks and dark red areas. There were small hæmorrhages at the periphery. The pelvis was normal.

Microscopic appearance of the kidneys. The cortex presented a varied appearance. There was some increase in the stroma with tubular atrophy in a few areas, while in others the tubules were comparatively normal. Many tubules showed hyaline and fatty degeneration of the cells, and not a few were necrotic in appearance. A few glomeruli were normal, but most of them showed various alterations in structure. Degenerative changes in the tuft varied from hyaline droplet degeneration to necrosis of many of the loops. Many tufts were collapsed and anæmic, but not a few showed hæmorrhagic infarction. A few glomeruli were completely hyalinized. Several small infarcted areas were observed in the left kidney.

The arteries showed the most conspicuous changes. The interlobar and arcuate arteries exhibited an extreme degree of intimal proliferation, which in some cases completely obliterated the lumen. The arterioles all showed extreme thickening of the intima, with narrowing of the lumen. Most of these arterioles showed hyaline change and many were necrotic. In the necrotic arterioles the limitation of the vessel walls was in-

distinct, and the cells showed nuclear disintegration. In many, the vessel walls was impregnated with red blood cells and some showed various degrees of aneurysmal dilatation. No leukocytic infiltrations were found in the neighbourhood of necrotic vessels, but in one or two cases the wall had completely given way, causing a circumscribed hæmorrhage.

The pectoralis major showed marked thickening of the arterioles with narrowing of the lumen.

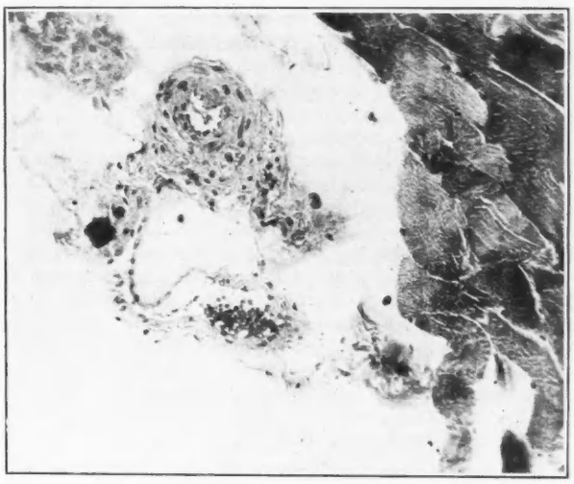

FIG. 8.—Section of the pectoralis major to show medial hypertrophy of a small artery. (x 300).

Brain.—Its surface was wet and pale. The vessels were soft, with only a few atheromatous patches, chiefly on the left posterior cerebral artery. No softening or hæmorrhage was present. On the choroid plexus on each side was a swelling the size of a bean.

Microscopic examination of the left testis showed that the seminiferous tubules were scanty and widely separated from one another. In most of them the cells had undergone a peculiar hyaline change and were fused together. Between the tubules were large masses of interstitial cells.

The anatomical diagnosis was: malignant hypertension, death being due to rapid renal insufficiency with uræmia; congenital hypoplasia of right kidney; undescended testicles.

This case illustrated very well the rapidly fatal course which malignant nephrosclerosis may pursue. The finding at autopsy of a greatly hypertrophied heart bore testimony to the fact that hypertension had been present for some time; yet, aside from an occasional headache, there had been no symptoms until four months prior to death, when weakness, dyspnœa and loss of weight developed insidiously. Gastro-intestinal symptoms dated back only two weeks, yet, when first observed, the patient was already in uræmia with a greatly elevated blood urea, a marked neuro-retinitis, and Cheyne-Stokes respirations. The age of the patient (43) is also significant. Generally speaking, the younger the patient, the more fulminant is the course of the disease.

The autopsy findings were very characteristic. It is interesting to note that in Klemperer and Otani's series,[5] one case (No. 9) showed a hypoplastic left kidney which weighed only 50 g., while the other kidney was slightly larger than normal. An identical state of affairs was present in this case, except that the right kidney was hypoplastic and the left one was decidedly larger than normal—weighing 225 g. The gross appearance of the larger kidney was very characteristic—a mottled surface, with flat granulations, and numerous hæmorrhages. The microscopic sections of the kidneys revealed practically every change which has been described in this form of hypertension.

CASE 2

A man, aged 43, admitted to the Winnipeg General Hospital on October 28, 1930.

Past history.—Poliomyelitis in 1917, otherwise negative.

Previous history.—The patient had had essential hypertension since 1923. During that time the blood pressure had varied from 140/80 to 175/90. The urine was quite normal until 1928, when albumin was found, but the function was apparently quite good. He felt well until April, 1930, when he noticed that his vision had become somewhat defective. The ophthalmologist who examined his eyes discovered bilateral neuro-retinitis, and he was admitted to the General Hospital for investigation. At that time, the heart was found to be enlarged clinically and by x-ray. The blood pressure was 216/136, falling to 170/130 after rest in bed. The urine showed marked albumin and a few hyaline casts on all examinations. The specific gravity varied from 1006 to 1026. The blood urea-nitrogen at this time was 19 mg. per 100 c.c. He was discharged on April 19th, feeling considerably improved. In June, 1930, he returned to work and continued to feel quite fit until October 1, 1930, when he again consulted his doctor about his eyes. Œdema and hæmorrhages in both retinæ were found, and the patient was again admitted for study on October 28th. On admission, the blood pressure was 240/160. The urine showed marked albumin and a few hyaline casts; specific gravity, 1010. The blood urea-nitrogen at this time was 37 mg.; red blood cells were 3,800,000; hæmoglobin 65 per cent; white blood cells, 12,200.

On November 5th, the patient was still feeling entirely well. There had been little change in the blood pressure. On November 7th, he vomited once and complained of feeling weak and nauseated. At this time the blood urea-nitrogen had risen to 53 mg. The water test showed 500 c.c. output three hours after taking 1,000 c.c. A concentration test was done showing complete fixity of specific gravity at 1010. The total day output was 1,500 c.c.; total night output 1020 c.c. During the next few days his condition became obviously worse. He complained of occipital headache, persistent nausea and loss of appetite. He vomited after nearly every meal. By November 19th, the blood urea had risen to 99 mg.; creatinine 8 mg. He then developed persistent hiccough and muscular twitching. The urinary output dropped steeply to 150 c.c. Blood pressure 245/165. By November 27th, the patient was irrational and semicomatose at times. Cheyne-Stokes respirations developed, and he died on November 29th.

Unfortunately, no autopsy was obtained in this case. The history is included here because

it illustrated the type of case in which essential hypertension had been present for a number of years in a youngish man with intact kidney function, until sudden renal insufficiency supervened and death occurred in uræmia.

Hypertension had been present since 1923, but until 1928 the urine was quite normal and renal function showed no diminution by the usual tests. In 1928, albumin appeared in the urine, but function was still unimpaired. As is often the case, the next event was a failure of vision, with the consequent discovery of a well marked neuro-retinitis. At that time (April, 1930), albumin was still present, but the concentrating power of the kidneys was good, and there was no elevation of the blood urea-nitrogen. By October 28, 1930, renal insufficiency had set in, and the subsequent course was one of rapidly fatal uræmia. The history brings out a point stressed by several observers, namely, that in a case of essential hypertension, the development of albuminuria and neuro-retinitis, even in the presence of normal kidney function, may herald the onset of the malignant phase of the disease.

In the absence of definite anatomical evidence, this case cannot be proved to be one of malignant nephrosclerosis, but the history is so characteristic that one feels justified in quoting it in this series.

CASE 3

A miner, aged 47, was admitted to the Winnipeg General Hospital on February 27, 1931.

Past history.—Chronic bronchitis intermittently for 35 years. Gonorrhœa in 1930.

Family history.—Both parents died in extreme old age. No history of cardiac or renal disease.

Present illness.—The patient felt quite well until October, 1930, five months prior to admission, when he began to notice that he became short of breath on any unusual exertion. About this time, he developed a cough with considerable expectoration, which aggravated the dyspnœa. The dyspnœa gradually became more marked, but seemed to occur in attacks of several days' duration, usually associated with an exacerbation of the cough. One week prior to admission, he developed an acute attack of breathlessness at night and such attacks recurred several times during the week. There was no history of œdema of the ankles or palpitation. He never suffered from headaches or dizziness. The appetite was good, and there was no nausea or vomiting. Between October, 1930, and February, 1931, he had lost 30 pounds in weight and was feeling considerably weaker than formerly.

Physical examination.—A pale, rather thin man of 47, obviously dyspnœic, even while lying quietly in bed. The head and neck were negative. The thyroid gland was not enlarged. The chest was negative. The heart was markedly enlarged to the left; the apex beat was in the 6th space, ¾ inch outside the nipple line. A soft systolic murmur was audible over the whole præcordium. The pulse was regular—110. The blood pressure was 199/130 at the first reading. No signs of congestive failure were present. The peripheral arteries were palpable and somewhat tortuous. Examination of the urine showed a specific gravity of 1010, and much albumin. The deposit showed 40 pus cells. Urethral smears were positive for gonococci. The blood count showed red blood cells, 4,110,000; hæmoglobin 75 per cent; white blood cells, 9,400. On admission the blood urea-nitrogen was 56 mg. per 100 c.c. The Wassermann test was negative.

Kidney function, March 1st: water test, 220 c.c. excreted in 3 hours; concentration test, specific gravity from 1010 to 1014; output, 840 c.c.; urea clearance test, 30 per cent function; 25 c.c. clearance.

Examination of the eye-grounds showed right optic atrophy with marked arteriosclerosis and hæmorrhages. In the left eye arteriosclerosis was not so marked. There was some œdema of the discs.

The electrocardiogram showed an inverted T-wave in the first lead; an isoelectric T in the second lead, with ventricular extrasystoles. Left ventricular hypertrophy. By March 6th, the blood urea had reached 66 mg.; creatinine 3.9 mg. The patient was nauseated and restless. He continued to sink, despite treatment, becoming apathetic and drowsy. On March 23rd, the blood urea-nitrogen was 93 mg. He became semicomatose that day and died on March 26th.

Autopsy findings.—The body was that of an emaciated man who looked much older than his age.

The heart was markedly enlarged (wt. 600 g.), the enlargement being entirely left-sided. There was great hyperplasia of the left ventricle, its wall measuring 18 mm. The wall of the right ventricle measured 4 mm. The coronary arteries showed a few small patches of atheroma but no distinct narrowing. The aorta showed hardly a trace of atheroma; the radial artery was normal; the renal arteries were moderately thickened. The liver showed fatty degeneration.

The left kidney weighed 100 g.; the right 120 g. The capsule stripped off readily, leaving a granular, red, and somewhat mottled surface. The cut surface was dark red in colour and showed some atrophy of the cortex. In places there were marked depressions of the cortex. The pyramids were normal. The small vessels stood out with undue prominence.

Microscopically, throughout the kidney were many sclerotic areas in which the glomeruli were partly or completely fibrosed and the tubules had disappeared. In the intervening areas glomeruli were comparatively normal, and the tubules were dilated and showed papillary processes. Many of the healthy glomeruli were much congested. Some of them showed hyaline degeneration of the glomerular tufts. All the small arteries showed extreme thickening of their walls, and some of the afferent arterioles were completely obliterated. A few of the latter showed necrotic changes.

All the small arteries in the pectoralis major were markedly thickened and the lumen greatly narrowed.

Diagnosis. — Malignant nephrosclerosis, without marked necrotic degeneration of the arterioles.

In this case the onset of terminal renal insufficiency and uræmia was considerably slower than in Case 1. Consequently one would expect to find changes of a less acute order in the kidneys. This was borne out at autopsy. Both kidneys were moderately contracted and did not show the variegated appearance with petechial hæmorrhages so typical of the fulminating cases. The microscopic appearance was also less acute. While both small arterioles and arcuate

arteries showed an extreme thickening, necrotic changes were rare. Many glomeruli were obliterated and others showed hyaline droplet degeneration of the capillary loop, but many glomeruli were quite normal in appearance.

CASE 4

A. O., male, aged 55, was admitted to the Winnipeg General Hospital, May 14, 1925.

History of illness.—Three years previously he commenced to feel weak and out of sorts. He suffered from dizzy spells, headaches, and had lost considerable weight. He was sent to hospital at that time and treated for hypertension. Apparently his kidney function was intact. After discharge he felt quite well until January, 1925, when his symptoms returned, with loss of appetite and nausea after meals. He was treated in St. Boniface Hospital for two weeks and discharged at the end of that time, feeling quite fit. On this occasion there was diminution of kidney function but no increase in blood urea-nitrogen. In May, 1925, two weeks prior to admission, he again developed dizziness, severe frontal headaches, and nausea after meals. One week later, he began to vomit frequently and suffered an acute exacerbation of all his symptoms.

Past history and *family history* were essentially negative.

Physical examination.—The patient was a fairly well nourished man of 45. Chest examination was negative. The heart was somewhat enlarged, with a marked accentuation of the aortic second sound. The blood pressure on admission was 265/170. The peripheral arteries were moderately sclerosed. Urinalysis showed a specific gravity of 1010; a moderate trace of albumin; no casts. Blood urea-nitrogen was 47.3 mg. The Mosenthal test showed a specific gravity fixed at 1010. Day urine—1,250 c.c.; night—650 c.c.; dye test—8 per cent. Examination of the eye-grounds showed neuroretinitis with a few hæmorrhages, and advanced sclerosis of the retinal arteries. He continued to vomit after every meal and became very restless. The blood pressure varied between 210/150 and 270/160. By June 14th, the blood urea-nitrogen had risen to 73 mg. The urine continued to show marked albumin—the specific gravity remaining fixed at 1010. The output fell to 800 c.c. in 24 hours. The centrifuged deposit showed an occasional hyaline cast. On July 17th, the blood urea-nitrogen was 173 mg.; creatinine 12.3. At this time the patient became drowsy and irrational. Muscular twitching appeared. By July 23rd, he had lapsed into coma and died the following day.

Autopsy findings.—The body was that of a fairly well nourished man of 45. There were numerous petechial hæmorrhages over the arms and the anterior surface of the trunk. The heart weighed 700 g. The enlargement was entirely left-sided, the wall of the left ventricle measuring 30 mm. The coronaries were patent. The aorta exhibited no atheromatous change.

The kidneys each weighed 95 g. The surface was fairly granular. The capsule stripped readily, exposing a pale, very granular surface. On section the kidneys were pale, and the vessels stood out prominently. On microscopic examination there was a moderate increase in stroma. Many glomeruli were completely hyalinized, others showing hyaline changes in several loops of the tuft, while a very few were quite normal in appearance. The tubules varied from normal to complete degeneration of the lining cells. The arcuate and interlobar arteries showed very marked intimal proliferation. Practically all the afferent arterioles were greatly thickened and showed hyaline degeneration. No necrotic changes could be found in the arterioles or glomerular tufts.

In this case there was a previous history of hypertension dating back three years. Seven months before his death, the patient began to exhibit signs of renal insufficiency, and on admission (nine weeks before death) definite uræmic manifestations were present. At autopsy, the kidneys were found to be contracted and granular; microscopically, they showed advanced arteriolosclerosis with hyalinization of the glomeruli. A careful search failed to reveal any necrotic changes in arterioles or glomeruli. This case might be classified as benign decompensated nephrosclerosis. The renal insufficiency was evidently produced by a gradual obliteration of the renal parenchyma secondary to arteriolosclerosis.

SUMMARY

In this paper the writer has attempted to review briefly the subject of renal insufficiency in essential hypertension. Particular emphasis has been placed on the characteristic clinical and pathological features which mark the more fulminant cases designated as malignant nephrosclerosis. The case histories quoted were chosen from a larger series to illustrate the various forms of renal failure which may occur in essential hypertension. Cases 1 and 2 were considered to be typical examples of malignant nephrosclerosis; case 4 as an example of benign decompensated nephrosclerosis or primary contracted kidney; while case 3 evidently represents a transition form between the benign and malignant types.

CONCLUSIONS

In a small percentage of cases of essential hypertension renal insufficiency ensues and death occurs in uræmia.

These cases may take the form of a gradual obliteration of the renal parenchyma due to arteriolosclerosis, or they may exhibit a rapid course due to necrosis of the afferent arterioles.

The essential difference between benign and malignant nephrosclerosis is probably one of time. Malignant nephrosclerosis may be regarded as an acute arteriolosclerosis.

Some cases show grades of severity intermediate between the benign and malignant forms.

This paper represents part of a study on essential hypertension undertaken as Gordon Bell Fellow of the College of Physicians and Surgeons of Manitoba. The writer wishes to express his thanks to Dr. C. R. Gilmour

for his many helpful suggestions, and to Dr. William Boyd for kindly placing at his disposal the autopsy material of the Winnipeg General Hospital.

REFERENCES

1. KERNOHAN, ANDERSON AND KEITH, *Arch. Int. Med.*, 1929 **44:** 395.
2. FISHBERG, Hypertension and nephritis, Lea and Febiger, Phila., 1930.
3. FAHR, *Virchow's Arch. f. path. Anat.*, 1919, **226:** 119.
4. JORES, *Virchow's Arch. f. path. Anat.*, 1916, **221:** 14.
5. KLEMPERER AND OTANI, *Arch. Path.*, 1931, **2:** 60.
6. KEITH, WAGENER AND KERNOHAN, *Arch. Int. Med.*, 1928, **5:** 939.
7. LOHLEIN, *Ziegler's Beiträge*, 1917, **63:** 570.
8. BELL AND CLAWSON, *Arch. Path.* 1928, **5:** 939.
9. SHAPIRO, *Arch. Int. Med.*, 1931, **48:** 199.

A SURGICAL AND CLINICAL STUDY OF NINE CASES OF CHRONIC SUB-DURAL HÆMATOMA

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SURGICAL TREATMENT

TWO surgical procedures have been advocated in the treatment of chronic sub-dural hæmatoma. In the light of our experience with 9 cases I am convinced that the wrong surgical procedure was used when we operated upon our earlier cases by using a large osteoplastic exposure in preference to a small bone opening. The chief purpose of this communication is to present certain arguments in favour of this latter view, because almost without exception it is possible to remove the fluid contents and soft clots by suction through a small bone opening. Drainage should follow the procedure, to permit the compressed brain to expand and obliterate the sub-dural cavity. Some surgeons are in agreement with this, while others are not. Putnam and Cushing[1] state: "On the whole a generous exposure of the lesion by an osteoplastic resection with or without a combined sub-temporal decompression to accommodate the subsequent œdema, would seem to be the preferential method." Other writers who apparently favour a large exposure by an osteoplastic flap are Grant,[2] Jelsma,[3] and Davis[4]; Rand[5] reports 5 personal cases, in 4 of which an osteoplastic flap was done, although at the end of the paper he states: "While an osteoplastic flap and removal of the hæmatoma—both linings and contents, as suggested by Putnam—may be the method of choice, it is felt that such a procedure need not be followed in all cases. It is not unlikely that any operative procedures such as a decompression with evacuation, or simple trephining and aspiration of the contents of the hæmatoma, will yield good results. When this is accomplished it seldom, if ever, refills, although the fate of the lining membrane is an open question."

Trotter, on page 365 of Choyce's Surgery, published in 1914, states: "These cases are suitable for the bone flap method, as there is usually not much œdema of the brain after the relief of pressure." In a subsequent paper he expresses a different opinion.—"The treatment of chronic sub-dural hæmorrhage presents no technical difficulties. If the lesion is unilateral, mere evacuation through an opening in the temporal fossa is all that is necessary. If the brain expands well, drainage is not indispensable or desirable. If the brain is very slow to expand, it is perhaps safer though not essential, to use a drain for twenty-four hours. In the case in which a bone flap was used, almost the whole of the cyst wall was removed. This does not seem to be necessary as a general rule and it is certainly not desirable to make a bone flap for that purpose only, especially if a bilateral exploration is to be done." This opinion of Trotter's has only recently come to my attention, but it is one with which I am in entire agreement.

Two arguments are advanced in favour of a large osteoplastic exposure.

(1) There are cases in which the sub-dural hæmatoma is solid and where a large exposure is essential; (2) A large exposure permits the possibility of removing the membrane which surrounds the liquefied hæmatoma.

With reference to the first argument, in my series of 9 cases a solid clot was not encountered. The content within the limiting membrane in 2 cases was straw-coloured fluid, in the others a mixture of chocolate-coloured fluid and soft clots. If in the future I meet with a case in which the clot is so well organized that it can not be removed by a sucker through a small opening, a bone flap will be turned down.

With reference to the second argument, that exposure by a large osteoplastic flap permits the possibility of removing the membrane which surrounds the liquefied hæmatoma, I would say

that even where such a procedure is possible it is unnecessary and may be dangerous. When the membrane is stripped from the dura troublesome oozing may occur and later result in the formation of a new clot. There is a greater possibility of this when the membrane is stripped from the dura beyond the immediate operative field, and as very few osteoplastic exposures are large enough to extend beyond the limits of the clot, which frequently reaches from one pole of the hemisphere to the other, this may occur. The thickness of the outer membrane is usually no greater than that of thin blotting paper, while the inner membrane when seen has been thin and transparent, very similar to the arachnoid. Membranes of this thickness will not cause intracranial pressure or symptoms when, as here, the sub-arachnoid space is intact. As the membranes are a reaction to a hæmatoma it is probable that they atrophy or even disappear after its removal. Horrax informs me that he had occasion to turn down an osteoplastic flap three months after the contents of a subdural hæmatoma had been sucked out through a small bone opening. He found that both the outer and inner limiting membranes previously indentified at the first operation had disappeared. So far as I know, this is the only real information which we have as to the ultimate fate of the limiting membranes if they are not removed.

In the following discussion of case reports an attempt will be made to show that a large osteoplastic flap is usually unnecessary and may be dangerous. Figures 1 and 2 illustrate the type of lesion encountered in this series.

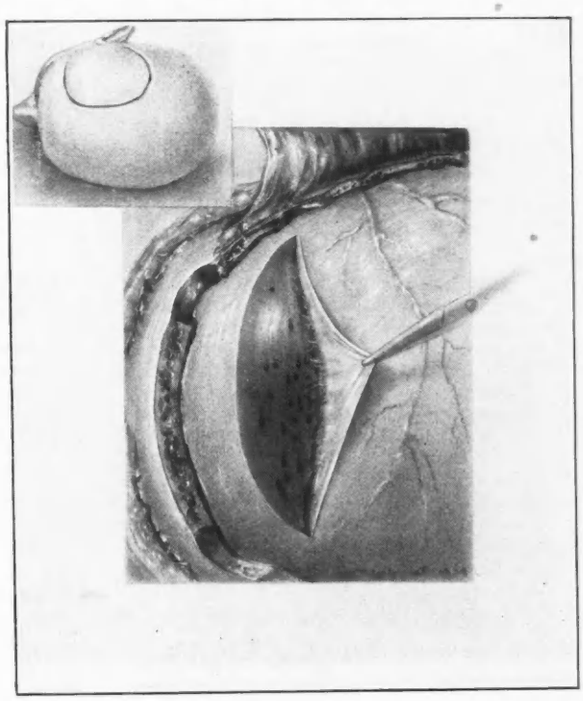

FIG. 1

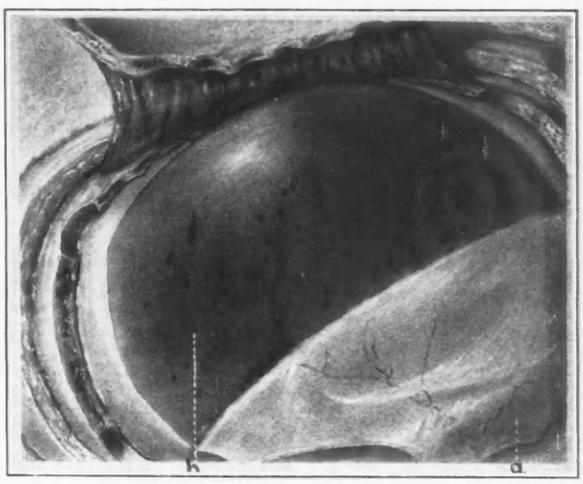

FIG. 2.—The typical appearance of a sub-dural hæmatoma when exposed by a large osteoplastic flap. b. The outer membrane of the clot. a. Dura.

CASE 2

A CASE IN WHICH THE SUB-DURAL HÆMATOMA RE-FORMED

Nov. 21, 1927. M. M. A parietal flap exposed a typical sub-dural hæmatoma which compressed the whole left hemisphere and extended down under the lower surface of the temporal lobe. That portion of the outer wall of the sac which was in the field was resected, and the contents consisting of liquefied blood and soft clots were removed easily by suction. At this stage of the operation, which had presented no unusual difficulties, the patient's pulse rapidly rose to 180 and the blood pressure began to fall. A blood transfusion was given, the flap of dura was replaced but not sutured, closure was completed without a decompression, although it was felt that this should have been done as the brain had expanded very rapidly, probably because of an internal hydrocephalus which had been demonstrated previously by a ventriculogram. It was surmised that the collection of liquefied blood extended down underneath the surface of the brain compressing the arachnoid spaces about the brain-stem and thus causing the internal hydrocephalus. Following the operation the patient's condition was critical for several hours. He then improved and it was hoped that progress would be satisfactory. Much to our disappointment, however, the vision steadily grew worse and the discs continued to show the same degree of choking. Nine days after the first operation a further exploration was decided upon.

Nov. 30, 1927. A large left frontal flap was turned down, so that the lower end could be used for a sub-temporal decompression if it were thought wise. The dura over the tip of the frontal lobe was very tense and blue and when it was opened, large, black, blood-clots burst out. Covering the left frontal lobe was a solid blood-clot at least half an inch thick and from two to three inches in diameter. Even after this had been removed the brain was still tense. Limiting the clot internally was a thin membrane through which one could see blood-stained fluid. At the previous operation it was thought that this membrane was arachnoid, and one wondered why the spinal fluid obtained by lumbar puncture had contained no blood. On opening this inner membrane, fluid gushed out in great amount, and we then appreciated that the fluid was between the arachnoid and this thin membrane, which had limited the blood-

clot internally. Several inches of this membrane were dissected away but, of course, it disappeared beyond reach in all directions. Only then was intracerebral tension relieved. A generous decompression was left over the left temporal lobe and the usual closure with a double interrupted layer of silk completed.

Dec. 14, 1927. Definite improvement in vision; the discs were flat but with marked secondary atrophy. Decompression, moderately tight.

Dec. 15, 1927. The patient was found with a right-sided hemiplegia in the morning. An incision was made over the decompression area but the brain was found against the temporal muscle.

Dec. 22, 1927. A good deal of movement coming back in the right arm; the decompression area was softer; apparently a good deal of aphasia.

From this time there was gradual improvement and the patient was discharged on Feb. 13, 1928. One year later there was no obvious aphasia, although an exact examination was difficult because of the patient's poor understanding of English. The patient walked well with a stick, but there was definite weakness of the right side of the body. The discs were white and flat, and vision was just sufficient to enable him to get about.

The solid clot found at the second operation formed after the first procedure, as the first operative note clearly states that the anterior end of the frontal lobe could be seen. The bleeding, however, may have taken place from the bone flap or line of scalp incision and found its way back into the sac, as the dura was not sutured in place because of the rapid closure.

One feels that many of the difficulties encountered in dealing with this dangerously ill patient could have been avoided if the clot had been evacuated originally through a small bone opening and drainage established. It is not clear why the patient developed the sudden hemiplegia two weeks after the second operation. It is the only case in which an internal hydrocephalus has been demonstrated although ventriculograms were done on six of the nine cases. Furthermore it is the only case in which blood-stained cerebrospinal fluid has been seen between the arachnoid and the inner membrane.

CASE 6

THE FORMATION OF A POST-OPERATIVE EXTRA-DURAL CLOT

H. G. Under general anæsthesia a large left frontal flap was turned down. The portion of outer membrane within the operative field was resected and the contents of the sac, which covered about two-thirds of the hemisphere and were a mixture of soft clot and chocolate-coloured fluid, were sucked out. A moderate-sized subtemporal decompression was left and the dura in the upper part of the field was sutured in place. The brain expanded moderately well, and what cavity remained was filled with normal salt solution. The flap was replaced and closure was carefully completed without drainage. Great care had been taken to leave a dry field, as it was felt that a post-operative clot was quite a possibility in this type of case where all intra-cranial pressure had been relieved suddenly. The patient remained dull and stuporous, suggesting that a post-operative clot had formed. The patient's general condition was such that re-elevation of the flap was out of the question. The temperature and pulse had steadily mounted and there were signs of a chest complication as early as twelve hours after the operation. The patient died 12 days later and a post-mortem examination disclosed a large mediastinal abscess. There was also a large extra-dural solid clot under the bone flap, the presence of which had been suspected.

Even with such a non-cooperative patient as this the minor operation of a small bone opening followed by drainage could probably have been carried out under local anæsthesia and the serious chest complication avoided. The occasional occurrence of a post-operative extra-dural clot following a bone flap is a very good argument in favour of a small opening where suture of the dura to the margins of the opening insures against such a complication. The contents of the sac in this case as in the other eight could easily have been sucked out through a small opening.

Judging from the literature the formation of a post-operative clot is not a common occurrence, although other writers have apparently had many anxious periods when they have thought of this possibility. There has been one verified case in this series, and one ventures to say that as long as osteoplastic flaps are turned down in the treatment of this disease there will be others, despite the most meticulous care in the control of hæmorrhage by stripping the bone flap well away from most of its blood supply and by suturing the dura to the margins of the bone opening. It is well recognized that a post-operative extra-dural clot is much more likely to occur in this type of case where all intra-cranial pressure is suddenly relieved.

A DISCUSSION ON THE REMOVAL OF THE CONTENTS OF THE SAC BY SUCTION THROUGH A SMALL OPENING FOLLOWED BY DRAINAGE

Four cases (5, 7, 8, and 9), have been operated upon through a small bone opening.

CASE 5

A burr hole, 1 cm. in diameter, was made over the left upper temporal region. The dura was blue and when it was opened the typical bluish outer membrane of the sac was encountered. This sac was opened and found to be only a few millimetres in thickness; the fluid content was clear and straw-coloured. The whole hemisphere was compressed and flattened, but when the fluid was sucked out with a soft catheter the brain expanded fairly rapidly, so that the cavity left was at no place deeper than 1 cm. This remaining cavity was filled with saline and the muscle and scalp closed without drainage. The patient remained rather dull for several days and then gradually improved. One year later he was at work and apparently well.

As drainage was not carried out the probabilities are that there is still a thin collection of fluid in this case. Drainage would have permitted complete expansion of the brain.

TABLE I.

SUMMARY OF NINE CASES

Case	*Age*	*Injury*	*History*	*Ventriculogram*	*Wass.*	*C. S. F.*	*Urine*	*Operation*	*Findings*	*Result*
(1) J. K.	56	Fell out of apple-tree, dazed; able to work and had no complaints for 2 weeks.	Referred by Dr. W. J. McLean, Shelburne, Ont. Two weeks after accident had severe frontal headache, questionable weakness of right arm and leg. Three weeks after accident very dull and stuporous for one day; 5 weeks after accident, mild choking (1 D) of discs; grip left 25, right 15; persistent coarse tremor of the right leg; reflexes brisk but equal; unsteady on feet, rather dull and stupid; a tendency to clonus of the right ankle; indifferent response, both sides, to plantar stimulation.	Ventricles displaced to right.	Neg.	Not examined.	Neg.	40 days after injury left frontal osteoplastic flap; no decompression; large part of outer membrane removed. Cavity filled with saline before closure. No drainage.	Typical subdural membrane a mixture of soft clots and dark-red fluid.	Alive and well 4 years after operation. He remained rather dull 2-3 days after operation, then seemed much brighter. Impairment of right arm and leg cleared up. Is running small store, tires easily; otherwise well since operation.
(2) M. M.	26	Fell from a height and fractured legs, dazed; is said to have landed on his feet and head not directly injured.	Referred by Dr. W. E. Gallie and Dr. Geo. Boyer. Immediately after the accident had severe headache for 2 days, then no complaint. No injury to head suspected; 62 days after accident severe headache and vomiting developed. There was marked choking of the discs; he rapidly became dull and stuporous; no definite localizing signs could be made out.	Ventricles displaced to right and dilated.	Neg.	Clear white, neg. for globulin.	Neg.	70 days after injury first exposure osteoplastic left flap exposing Rolandic area. Closure without decompression or drainage. Second exposure by a more anteriorly placed flap and subtemporal decompression. No drainage.	Typical subdural membrane. First exposure a mixture of soft clot and dark red fluid. Second exposure solid clot.	Alive 3 years after operation, but with only sufficient vision to count fingers. Post-operative course was stormy and complicated by a wound infection and marked hemiplegia which largely cleared up.
(3) H. B.	24	Hit on the head, dazed, continued work.	Referred by Dr. Val Stock. Ten days after injury he suddenly became dizzy, vomited, and remained in bed from that time. Headache severe; frequent attacks of vomiting. Fourteen days after the accident he had bilateral choked discs, 3-4 D; questionable right lower facial weakness; slight unsteadiness when on feet. He was mentally clear and co-operated well, except when he had severe headache; a careful neurological examination two days later revealed no localizing signs.	Ventricles displaced to left.	Neg.	Clear white, neg. for globulin.	Neg.	25 days after injury right osteoplastic flap with sub-temporal decompression. Cavity filled with saline. No drainage.	Typical subdural membrane; a mixture of soft clots and dark-red fluid.	Alive and well 2¼ years after operation. The post-operative course was continuous. Two weeks after operation the discs were flat. No residual disability of any sort.

Continued on page 538.

TABLE I.—*Continued*

SUMMARY OF NINE CASES

Case	*Age*	*Injury*	*History*	*Ventriculogram*	*Wass.*	*C. S. F.*	*Urine*	*Operation*	*Findings*	*Result*
(4) G. M.	12	Fell off a truck, hit head, dazed.	Referred by Dr. G. Boyer. No headache following accident; he was able to go to school the next day. No complaint until 4 months after the accident when he commenced to develop severe headache and vomiting. Examination showed high choked discs and marked unsteadiness on feet. A midline cerebellar lesion was diagnosed, but cerebellar exposure was discontinued when the ventricles were found to be small. After a ventriculogram was done and positive diagnosis of left-sided supra-tentorial lesion made, repeated careful examinations failed to show any localizing signs; between headaches the patient was bright and co-operated in an excellent manner. No character change could be made out.	Ventricles displaced to right.	Neg.	Not examined.	Neg.	130 days after injury left frontal flap, no decompression; no drainage.	Typical subdural membrane, soft clots and dark-red fluid. No extension over temporal lobe.	Alive and well 2¼ years after operation; doing well at school. Progress was slow for a week following operation.
(5) Mr. F.	56	In an accident, badly shaken up and dazed, no direct injury to head.	Referred by Dr. H. I. Kinsey. Headache developed 7 months after injury; over a period of a month became bed-ridden with severe headache, attacks of vomiting, periods of coma; incontinent at times; mild hallucinations. Slight weakness developed in left arm with occasional ankle clonus and questionable Babinski in left. Discs showed no choking. After recovery the patient stated that he had felt that his mind had not been quite clear for six months.	Not done.	Neg.	No globulin clear.	Neg.	270 days after injury a right upper temporal burr hole.	Typical subdural membrane. Right hemisphere collapsed by clear yellowish fluid; sucked out; closure without drainage.	Alive and well 2 years after operation. Progress was continuous after the operation.
(6) H. G.	51	Bumped head on steering wheel of car, dazed.	Referred by Dr. S. F. Leavine. No definite complaints for 2 months after accident, although friends state that before this time they were afraid to drive with him because his judgment was poor. After 2 months headache became severe; he was also unsteady in gait, got much better for a few weeks, then returned much worse. Examination showed choked discs (4-5 D) marked unsteadiness of gait, no nystagmus; thought to be a cerebellar lesion, nothing to suggest a supra-tentorial lesion.	Ventricles displaced to right.	Neg.	Not examined.	Neg.	60 days after injury left frontal flap, sub-temporal decompression; no drainage.	Typical subdural membrane; mixture of soft clot and blood-stained fluid.	Death. Mediastinal abscess. Post-operative clot.

(7) Mrs.S.	48	Two accidents: 1. Unconscious for 2 hours, 4 years ago. 2. Slipped and bumped back of head, dazed.	Referred by Dr. E. Shouldice. No symptoms followed first accident, except some questionable character change. Two hours after second accident developed severe headache and vomiting; this lasted 2 days, then eased up. Seven days after accident she had some double vision; 10 days after headache severe again; questionable choking of discs; 3 days later was having periods of marked drowsiness; the discs now definitely choked. No localizing signs to be made out; incontinent at times.	Not done.	Neg.	Clear white; no globulin; pressure 6 cm. of fluid.	Neg.	2 accidents, 4 years after first or 20 days after second negative burr hole right frontal region. Small bone defect left upper temporal region. No drainage.	Typical bluish membrane beneath dura, but the fluid was clear and stained gauze yellowish green. A thin inner membrane over arachnoid was noted.	Alive and well, 1 year and 8 months after operation. Post-operative course stormy and wound had to be re-opened to let out more fluid.
(8) G. H.	48	Tripped and hit left side of head on curb; unconscious for a few moments.	Referred by Dr. R. Armour. Severe headache for 2 days after accident. Four weeks later headache, again severe; he was able to carry on with work for another 3 weeks, then had to remain in bed; there were periods when he was quite comatose and incontinent. On examination, 2½ months after the accident, he had hemiparesis of left arm, face and leg. Positive left Babinski. The discs could not be seen because of myopia. A diagnosis of right sub-dural hæmatoma was made.	Ventricles displaced to right.	Neg.	Not examined.	Neg.	1. Negative burr hole right frontal. 2. Ventriculogram. 3. Exploration of left upper temporal region through small bone opening. No drainage; later, drainage necessary.	Typical subdural membrane. Mixture of soft blood clot and dark-red fluid.	Alive and well 9 months after operation. Post-operative progress unsatisfactory until drainage was established.
(9) Mr. B.	30	Bumped head on sandy bottom while diving.	Referred by Dr. Howland. He was able to swim to shore; that night had moderate headache and felt dizzy. The head continued to feel heavy, right arm seemed stiff; remained fairly well for 2½ months; then he developed severe frontal headache, attacks of vomiting, periods of marked drowsiness; at times became quite childish. Advised to enter hospital. On examination the following positive findings were made out: Patient dull, facetious; moderate bilateral choking of discs; lessened right grip; ataxia right arm; reflexes slightly increased left arm; diminished right abdominal; gag reflexes equal. Marked instability of gait and stance. Despite absence of nystagmus a cerebellar lesion was thought most likely diagnosis.	Attempted on right side opened into sub-dural hæmatoma.	Neg.	Not examined.		3½ months after injury ventriculogram burr hole right posterior parietal region enlarged to 1 inch in diameter; sucking out of soft blood clots and red-stained fluid; cavity filled with saline; drainage 3 days, with ¼ inch tube; cavity obliterated at end of that time.	Typical subdural membrane. Mixture of soft blood clot and dark-red fluid.	Alive and well 8 months after operation; no complaints; signs and symptoms cleared up almost immediately after operation, out of bed on 5th day, discharged on 10th day. Despite fact that this was a large hæmatoma extending over whole hemisphere at least ¾ of an inch thick, post-operative course was unusually smooth and free from anxiety. This was largely attributed to removal of contents through a small bone opening associated with drainage.

Summary of Results.—9 cases operated upon; 7 cases alive and well; 1 case alive but nearly blind; 1 case dead.
Note.—See two additional cases at end of paper.

CASE 7

The operative findings in this case were identical with those in Case 5. The post-operative course was stormy, and a few days later the wound was re-opened and a large collection of fluid under tension found.

Drainage would have avoided this second operation. Although this patient is well it is possible that there is still a collection of fluid, since drainage was not employed even after the second operation.

CASE 8

Exploration through an opening 2 cm. in diameter in the left upper temporal region, removal of soft clots and blood-stained fluid by suction. The whole hemisphere was compressed to a marked degree, and expanded so slowly that only about one-half of the cavity was obliterated. Closure was carried out without drainage and without filling the cavity with saline. There was immediate return to consciousness, but six hours later the patient was again unconscious. The wound was re-opened and there was a spurt of air and clear fluid under pressure. The cavity was still the same size as on completion of the first operation. This time drainage was established with a tube one-half cm. in diameter and the cavity filled with saline. The patient again promptly regained consciousness. The drain was removed at the end of twelve hours. Six hours later the patient again became unconscious and the procedure had to be repeated. This time the tube was left twenty-four hours and before taking it out we satisfied ourselves that the brain had expanded, because we were unable to suck out or inject saline through the tube. Following this last procedure the patient remained well.

This case forcibly impressed us with the importance of drainage until the cavity is obliterated by expansion of the brain.

CASE 9

The procedure and findings were very much the same as in the preceding cases except that drainage was established at the first operation and the tube removed twenty-four hours later after we had satisfied ourselves that the brain had expanded. Convalescence in this case was much more rapid and satisfactory than in any of the other cases. The patient remains perfectly well six months after operation.

SUMMARY

Five cases were operated upon by a large osteoplastic flap. The outer membrane immediately in the operative field was resected. A decompression was left in most of these cases, no drainage was employed, and any cavity left at completion of the operation was filled with saline. Great difficulty was experienced in obtaining a dry field and convalescence was almost invariably troublesome. It is now our conviction that these patients were submitted to a large, difficult and somewhat dangerous operation when a much more simple procedure would have sufficed. Fortunately none of our cases were bilateral, or the mortality would likely have been higher in the cases submitted to an osteoplastic exploration.

Four cases were operated upon through a small bone opening. In two of these drainage was not employed and convalescence was delayed. In the third case drainage was finally established and convalescence then became satisfactory. In the fourth case drainage was established from the start and recovery was prompt and continuous. All of the nine cases could have been operated upon by the simple procedure of sucking out the contents of the sac through a small opening from 1 cm. to 2 cm. in diameter, filling the cavity with saline, and employing a large tube to permit the saline to escape as the brain gradually expanded to obliterate the cavity. An opening in the upper temporal region would have located the hæmatoma in all of the cases. The opening can be planned so that it can be part of a bone flap if a hæmatoma is not discovered, or if the hæmatoma should prove to be one of the rare solid type. The drainage tube should be 0.25 cm. in diameter and should project just through the dura and outer membrane of the sac. At the conclusion of the operation the cavity is filled with saline and this can be seen to rise and fall in the tube with the pulsations of the brain. The probabilities are that at the end of 48 hours the cavity will be obliterated. This is shown by the fact that saline can no longer be seen pulsating in the tube. It is then safe to discontinue drainage. One has no fear of a cerebrospinal fluid leak when drainage is employed in these cases, as the arachnoid is intact.

CLINICAL FEATURES

Chronic sub-dural hæmatoma was clearly described and discussed by Trotter[6] in 1914. In 1925 there was an important paper on this continent by Putnam and Cushing[1], and this was followed by contributions from Rand[5], Jelsma[3], Grant[2], Sherwood[7], Brodie[8], and others. The patients have usually consulted their physicians because of severe headache. On examination a choked disc is frequently found and a diagnosis of brain tumour made. The correct pathological diagnosis is arrived at by obtaining a definite history of trauma which usually will have occurred some six weeks or two months previously. Only occasionally is the trauma severe enough to render the patient unconscious, and frequently is so mild that no mention is made of it. The hæmorrhage in most instances probably takes place from one of the unsupported cerebral veins which cross the sub-dural space to

enter the longitudinal sinus. These veins are shown in Fig. 3. In a few weeks' time the blood clot becomes enclosed by a newly formed membrane which has a fine vascular attachment to the dura but no attachment to the arachnoid. The clot enclosed in this membrane breaks down, so that at operation one usually finds a mixture of soft clots and old liquefied blood inclosed in this limiting membrane.

It is not quite clear why symptoms should appear so long after the hæmorrhage has taken place; possibly fresh bleeding takes place from the newly formed outer membrane which contains many new vascular channels, or perhaps fluid is attracted into the sac by an increase of osmotic pressure brought about by the breaking down of the clot. At any rate, there is a period of several weeks following the accident when these patients are practically free from symptoms.

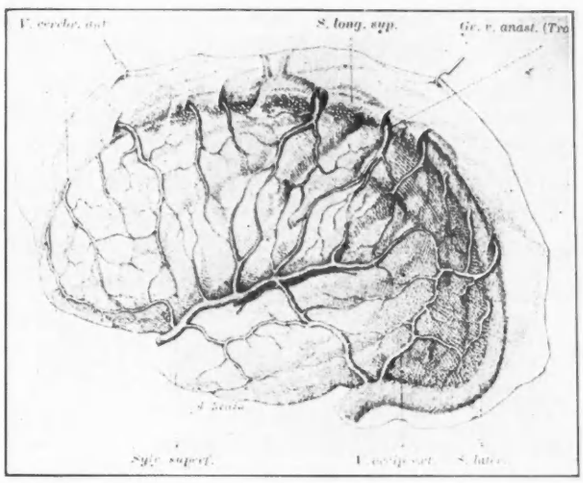

FIG. 3.—Showing veins crossing the sub-dural space to enter the longitudinal sinus. (In part after Poirier).

It is of interest to analyze our nine cases under the various headings that Jelsma has adopted in his paper based on a study of 42 cases, 5 of which were taken from the personal series of Griswold and Jelsma. Finally our cases have been studied under the heading "Localizing Signs," a study which has been of special interest to us as the signs were either confusing or conspicuous by their absence in a large percentage of the cases.

TABLE II

	Average age	*Males*	*Females*
(Jelsma)	39.2 yrs.	93 per cent	7 per cent
(McKenzie)	41 yrs.	82 per cent	18 per cent

The youngest patient was twelve, the oldest sixty-two. In this connection it is of interest to recall the papers by Schwartz, Sherwood and others reporting cases occurring in infants. So far as I am aware this lesion has not been recognized, or has been overlooked in infants in Toronto.

ETIOLOGY

In Jelsma's series 88 per cent had a definite history of trauma, and in ours 90 per cent. In only 2 of the cases was the trauma severe enough to cause unconsciousness; one of these cases was unconscious for two hours, the other for a few minutes. It appears clear that this lesion is uncommon after severe injuries to the head. It has been suggested that if the lesion is due to injury, it should be met with more frequently

TABLE III.

SYMPTOMATOLOGY

	Mental Change	*Remission*	*Head*	*Drowsiness*	*Motor Disturbance*	*Latent Period*	*Coma*	*Reflex Change*	*Cranial Nerve Disturbance*
McKenzie	Per cent 20	Per cent	Per cent 100	Per cent 100	Per cent 40	Per cent	Per cent 30	Per cent 40	Per cent 0
Jelsma...	86	84	79	79	70	70	57	56	47

	Lucid Interval	*Choked Discs*	*Vomiting*	*Pulse Changes*	*Increase Temperature*	*Sensory Disturbance*	*Nystagmus*	*Retinal Hæmorrhage*	*Fracture of Skull*
McKenzie	Per cent 100	Per cent 90	Per cent 60	Per cent	Per cent	Per cent 0	Per cent 0	Per cent	Per cent
Jelsma...	45	40	29	27	13	12.5	11	11	4.5

when one considers the number of severe cranio-cerebral injury cases that are admitted to hospital to-day. A possible explanation of the rarity of the lesion following a severe injury is that the œdema of the brain develops so extensively and rapidly that venous bleeding is impossible. It is important for the medical profession to establish the relationship of trauma, as it is often necessary to decide whether the patient is entitled to compensation. The Compensation Board of Ontario has admitted the relationship of the trauma to the lesion in two of these cases where compensation was claimed.

Headache.—A number of the patients had a severe headache for a day or so following the accident and then a period of relief varying from two days to seven months, with an average of two months before the headaches again became severe and established as a constant symptom. Several of the patients lateralized the headache to the side of the lesion; this was especially true with the first attack of headache immediately following the trauma.

Mental changes.—Jelsma[3] states that mental changes simulating those accompanying lesions of the frontal lobes occurred in 86 per cent, but he did not make it clear just what these mental changes were. In our series one could say that all of the patients gradually became slow and stupid. This retardation of mental processes varied from time to time as did the headache, and probably depended upon a variability of pressure due to changing œdema of the brain. One case was childish and facetious, and might have been considered a mental case, if it had not been for the very definite complaint of headache and well marked choked discs. Patient 5, who was operated upon 270 days after the trauma, had mild hallucinations, and if headache, attacks of vomiting, coma, and incontinence had not been such outstanding symptoms, he might have been admitted to an asylum. Following his operation he stated that he felt that his mind was again clear, and that it had not been working properly for the previous six months. Case 7, was interesting in that the fluid was clear and yellow and one can surmise that the lesion dated from an accident four years before; despite this long period one could only say that the patient was unusually talkative but her son and other relatives could recall no real change in her personality following the accident. From a study of these cases one feels that decided and obvious mental changes apart from dullness are unusual, and that following operation, even when the lesion has been present for months, a complete restoration to mental normality is to be expected. The fact remains that the lesion is a common autopsy finding in asylums for the insane. Is this so because insane people injure their heads more frequently than normal people, or are their vessels abnormal and unsupported by an atrophied brain and so more easily injured, or is their insanity due to the lesion and would it clear up if the lesion could be diagnosed and operated upon? These are problems that should be of great interest to anyone especially concerned with the treatment of the insane. Theoretically, one can conceive of a lesion not sufficiently large to cause marked headache and changes in the discs gradually developing mental changes and remaining undiagnosed, although, as stated before, mental changes have not been very obvious or striking in this series of cases, but it is only fair to state that most of the patients were operated upon within a few weeks or months following the trauma.

A Review of the Cases From the Standpoint of Correct Localization

Case 1.—In the light of our present knowledge, this case would probably be correctly diagnosed, although the positive localizing signs were not very definite. To-day in a case with this history exploratory burr holes over both temporal regions would be carried out in preference to a ventriculogram.

Case 2.—The lesion might be suspected from the history, but a ventriculogram or exploratory burr hole would be necessary for localization.

Case 3.—A left-sided lesion was suspected because of questionable right lower facial weakness. A ventriculogram proved that this was wrong and that the lesion was on the right side. Compare with Cases 8 and 9.

Case 4.—Clinically a midline cerebellar lesion, because of the marked unsteadiness of gait. The error in diagnosis was appreciated because the ventricles were found to be small when they were tapped as a preliminary to a cerebellar exploration. Even after the ventriculogram disclosed a left sided supratentorial lesion, I was unable to demonstrate any lateralizing signs. There was little enthusiasm for a further operation on this case, as it was felt that the child had a supratentorial tumour. Such an experience as this makes one feel that a hopeless prognosis should seldom be given unless one knows exactly

the nature and situation of the lesion, and one such case as this justifies many explorations which have disclosed hopeless lesions.

Case 5.—Slight but sufficient weakness and changes in the reflexes to lateralize the lesion. A ventriculogram was not made.

Case 6.—The diagnosis of a cerebellar lesion was made because of marked unsteadiness of gait. Absence of nystagmus made one suspicious of the diagnosis. The ventriculogram disclosed a left supratentorial lesion (compare with Case 4). No lateralizing signs could be demonstrated.

Case 7.—No localizing signs. An unsuccessful attempt was made to do a ventriculogram. The lesion was located in the left frontal region by an exploratory burr hole.

Case 8.—Paresis of the left arm, face and leg, with increased reflexes and a positive Babinski sign on the left, together with a history of trauma, made the diagnosis of a right supratentorial lesion appear certain. A negative exploration was carried out through a small burr hole (If this case had occurred earlier in the series it is quite possible that the patient would not have survived as a bone flap would have been turned down and a decompression left—the shift of the brain from this procedure would likely have caused a mortality). A ventriculogram was then carried out and disclosed a lesion on the same side as the paralysis. The case has been previously referred to in this paper as it presents several excellent arguments in favour of dealing with these lesions by drainage through a small bone opening, rather than by an osteoplastic exposure and attempted removal of the sac membranes. The hemiparesis on the same side as the lesion is explained by pressure on the pyramidal tract by the free edge of the tentorium on the opposite side to the lesion.

Case 9.—Because of the marked instability of gait and stance a cerebellar lesion was considered the most likely diagnosis, although a slight weakness, ataxia of right arm and diminished right abdominal reflex, suggested a left supratentorial lesion. These signs were misleading, as a ventriculogram burr hole disclosed a right-sided lesion. Compare with Cases 8 and 3.

It is interesting to note that a ventriculogram was employed in 7 of the 9 cases. This number of ventriculograms indicates that the localizing neurological signs were indefinite. Furthermore, the signs present were often misleading. Case 8, which showed the most marked weakness and changes in reflexes was very confusing as the lesion was on the same side as these changes; also in Cases 3 and 9, the few indefinite localizing signs were on the same side as the lesion. One is also impressed by the number of cases that exhibited marked instability of stance and gait suggesting the diagnosis of a cerebellar lesion. Cases 4, 6, and 9, really one-third of the cases, are outstanding examples, although the absence of nystagmus would lead one to question the diagnosis of a cerebellar lesion.

CONCLUSIONS

1. Cases of sub-dural hæmatoma should be operated upon by removal of the contents of the hæmatoma by suction through a small bone opening. The exception to this rule is when a case is encountered which has a solid clot.

2. The cavity should be filled with saline and drainage established with a good-sized tube. This allows the saline to escape and permits complete expansion of the brain and obliteration of the cavity.

3. The use of a large osteoplastic flap is usually unnecessary and may be dangerous, especially if the case should prove to have a bilateral hæmatoma.

4. It is not necessary to remove the outer or inner membrane of the hæmatoma.

5. The localizing signs are often confusing or entirely absent, so that a ventriculogram or one or more exploratory burr holes is frequently necessary.

ADDITIONAL NOTE

This paper was completed but not submitted for publication at the time the paper by Fleming and Jones[9] appeared, so the opportunity has been taken to add this additional note and discuss their paper, also to report two recent cases which bring our series up to 11.

CASE 10

Mr. G. R. Minor injury to head six weeks before coming under observation because of severe and continuous headache. The patient was unusually bright and co-operative and this absence of dullness made us question the diagnosis. There was a marked choking of the discs and the only lateralizing sign was a suggestion of weakness in the left leg. A burr hole in the upper right temporal region disclosed the typical lesion. Drainage was employed for forty-eight hours at the end of which time the brain had expanded and obliterated the cavity. The headache was immediately relieved. On discharge from hospital two weeks later the discs were nearly flat. The patient stated that he felt he could think more clearly. Three weeks later the discs were approaching normal and the patient wished to return to work.

CASE 11

Mr. M. K. Minor injury to head three months before coming under observation because of severe headache. Marked bilateral choking of the discs. The

patient lay in bed the whole time with his hands to his head, but there was no definite period of coma or marked stupor. The lesion in this case was lateralized by a slight weakness of the right face and arm. Apart from the choked disc and these findings the neurological examination was negative. A typical lesion was encountered on the left side. A burr hole in the upper part of the temporal region was just at the bottom of the sac. Drainage was established as in Case 10 for forty-eight hours. This operation was only five days ago, and although convalescence is satisfactory, in that headache is relieved and the discs are flattening out, a burr hole will be made over the right hemisphere to definitely rule out the possibility of a bilateral lesion.

I am forcibly impressed by the fact that four out of the eight cases reported recently by Fleming and Jones[9] were bilateral. In future, a bilateral exploration will be carried out in all of our cases. These authors point out the value of the pineal shadow shift. Sufficient attention was not paid to this valuable diagnostic point in our series.

As in my paper the authors advocate operation through a small bone opening. Closure of the operative wound is carried out without drainage, but despite the fact that their results were satisfactory, I believe drainage should be established (see discussion of operation in Cases 7 and 8 of my series, and the final summary of the operative treatment of all of the cases). I also consider it unnecessary to make two burr holes over the one hemisphere. In the main essential, however, we agree. Both papers have been written to point out the value of operating on these cases with a small opening rather than by turning down a large bone flap.

REFERENCES

1. PUTNAM AND CUSHING, *Arch. Surg.*, 1925, **11:** 329.
2. GRANT, *Ann. Surg.*, 1927, **86:** 485.
3. JELSMA, *Arch. Surg.*, 1930, **21:** 128.
4. DAVIS, Discussion of a paper by W. H. Bolmes in *Arch. Neurol. & Psychiat.*, 1928, **20:** 162.
5. RAND, *Arch. Surg.*, 1927, **14:** 1136.
6. TROTTER, *Brit. J. Surg.*, 1914, **2:** 271.
7. SHERWOOD, *Am. J. Dis. Child.*, 1930, **39:** 980.
8. BRODIE, *Canad. M. Ass. J.*, 1929, **20:** 273.
9. FLEMING AND JONES, *Surg., Gyn., & Obst.*, 1932, **54:** 81.

YEAST INFECTION IN MAN

(WITH A REPORT OF A CASE)

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IN spite of extensive researches on the part of certain authors, great confusion still prevails in the classification of the yeasts. The monograph of Stoddard and Cutler[6], published in 1916, although it added little new on the subject, is up to the present time the most complete review of the yeast-like infections in man, and offers a classification of these parasites, which, although broad, is the most satisfactory yet published.

True yeast infection is rare. Two cases have been reported by Busse, in both of which skin lesions were present. Torula infection is due to yeast-like organisms. This group has never been known to involve the skin, but is peculiarly prone to localize in the central nervous system, giving rise in undiagnosed cases to the so-called "pseudo-tumour" of the brain. Torula lesions are of two types. If the reaction is sharp, nodules, with or without central necrosis, are formed, very similar to the familiar lesion of tuberculosis. In contrast to blastomycetic lesions, polymorphonuclear leucocytes are not attracted. On the other hand, there may be little cellular reaction to the parasites. Rather, there is a slow solution or lysis of the tissues involved, which become replaced by a peculiar gelatinous material extending from the neighbourhood of the organisms in threads and radiating processes.

"Blastomycosis" includes several fungus diseases, and for this reason most authorities advocate the abolition of the term in favour of a more specific terminology. Oidiomycosis, included under this caption, has a wide distribution in its incidence. The lesions produced are of a chronic suppurative character and in no instance has a gelatinous matrix been encountered. Ten per cent of the cases with cutaneous lesions recover. Iodides are of established value in this disease. Unlike oidiomycosis, coccidiodosis is a disease, usually fatal, which has had a peculiarly limited incidence, most cases in the United States occurring in natives of the San Joaquim Valley, California. The lesion is of a chronic suppurative character and systemic distribution is the rule.

A comparison of the parasites is a definite help in diagnosis, although by a study of their morphology alone certain recognition is not always

possible. Torula parasites vary from 1 to 13 μ. in diameter. The doubly-contoured organisms of oidiomycosis are larger, varying up to 20 μ. in size, the average, however, being usually less than 16 μ. The cells of the coccidioidal granuloma are still larger, measuring up to 30 μ. or more in diameter. In torula infection the organisms reproduce only by budding; they never form endospores, and never produce a mycelium. Oidiomyces do not sporulate, but form a mycelium in cultures and also bud in tissues. In contrast, the coccidioides never bud in tissues, and their large mature forms may contain many ascospores.

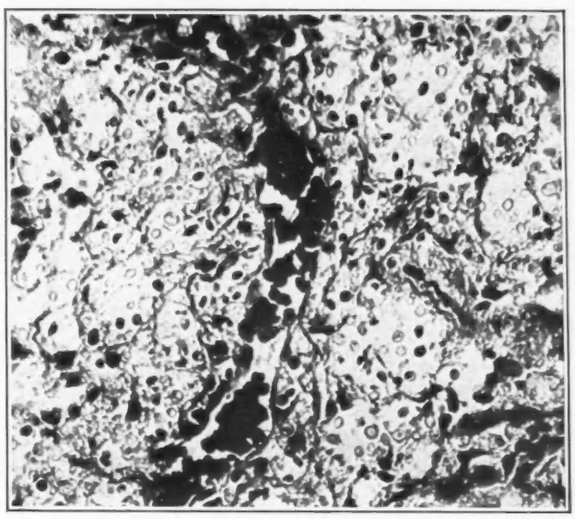

FIG. 1.—Lung alveoli filled with exudate and parasites. (x 400).

To make a satisfactory study of any of these yeast forms, it is necessary to observe their growth upon artificial media and to determine their action upon the sugars. This, unfortunately, was not done in this instance. Consequently, it has not been possible to determine accurately into which group of the yeasts the organism described below should be placed. The morphology is sufficiently bizarre to make impossible a diagnosis based upon fixed tissue characteristics. Inasmuch as the lung was involved, the possibility of bronchomoniliasis is suggested. The organisms, as shown below, are not monilia, since arthrospores, mycelium and the monilia "buttons" are absent.

CASE REPORT

The patient was a white male, aged 59, a bookkeeper by occupation. He was admitted to hospital because of an intractable skin lesion from which he had suffered for eight years. A diagnosis of exfoliating dermatitis was made. The patient's general condition steadily regressed and he died eight months after admission.

Post-mortem examination revealed an acute vegetative endocarditis, an acute myocarditis, and an acute nephritis, all of which were terminal events occurring in an individual in very poor general condition.

The skin was thickened and of a bronzed scaly character. It was irregularly scarred and presented here and there areas of superficial ulceration. Microscopically, the epidermis was slightly thinned out and occasionally ulcerated. Throughout the corium there was a marked infiltration of lymphocytes and cells of an endothelioid character. This reaction was very sharply limited to the corium, which passed abruptly to healthier subcutaneous tissues. Many sections were studied but organisms were not identified within the skin.

The left lung was of peculiar interest. Upon its pleural surface were numerous small, raised, opaque areas, averaging about 3 mm. in diameter; and within the substance of the lower lobe were several greyish patches looked upon, macroscopically, as areas of consolidation. Microscopically, however, the organisms described below were found both in the lung parenchyma and in the pleural

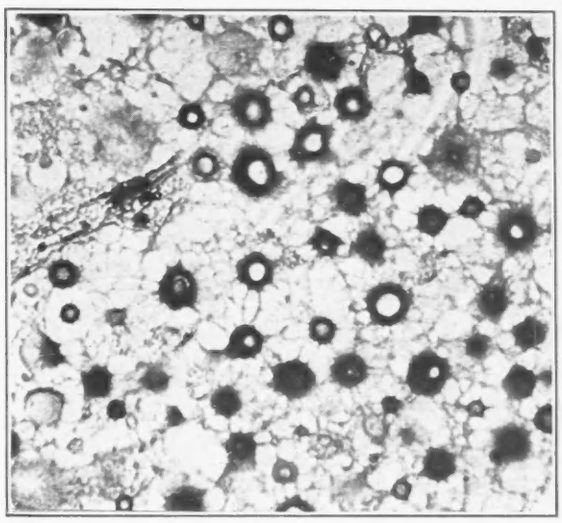

FIG. 2.—Yeast parasites in large numbers within lung alveoli suspended in a mucoid matrix. (x 400).

nodules. Sections of the latter presented a compact pseudo-capsule of dense fibrous tissue surrounding a rather homogeneous pink background, in which large numbers of rounded forms were observed. These possessed capsules of a single layer, and presented in one or two fields definite evidences of budding. In these pleural nodules the structure of the contained organisms was remarkably uniform, in contrast to the great variation noted throughout the lung substance proper. Of the lung parenchyma, little could be made out, the alveolar outlines being pale, ragged and moth-eaten in appearance. The blood vessels were not dilated, there was no appreciable increase in fibrous tissue, and little active inflammatory reaction accompanied the parasites. Here and there large granular endothelial cells, "foam cells", contained one or two phagocyted organisms.

The parasites were stained best with polychrome methylene blue, being poorly delineated by all the usual staining methods. They differed greatly not only in outline but also in size, varying from 2 to 3 μ. in diameter to forms reaching approximately 30 μ. in diameter. The smallest forms were oval in outline, and possessed either at one extremity alone or at both poles small crescents of intensely stained basophilic material. These "caps" were separated by pale-staining, almost vacuolated, zones. Such small forms were usually arranged in clusters or "showers" and were not infrequently most numerous within the perivascular lymphatic channels. As the parasites increased in size, the clear central zone also increased to the apparent disadvantage of the basophilic material, which gradually faded out. Many forms varying

from 7 to 10 μ. in diameter were noted, these being for the most part rounded or slightly oval, possessing a single capsule and having a clear centre completely void of any trace of cytoplasm. However, in some instances within such cells small reddish granules were observed, the significance of which could not be determined.

The largest forms varied from 18 to 27 μ. in diameter, were usually rounded or oval, and for the most part lay embedded in a more or less gelatinous bed which proceeded in stellate prolongations from the individual cells. Consequently, where many such cells were closely arranged the effect produced was that of a fine, almost mosaic, pattern. Some of these larger forms were possessed of clear centres similar to the smaller organisms, but the majority possessed basophilic material, present in such quantities in some cells that all other cellular structure was obliterated. Throughout the lung substance budding forms were occasionally seen. Ascospores were looked for and although occasional forms were noted within some of the larger cells, these, while very suggestive, could not be definitely established as such.

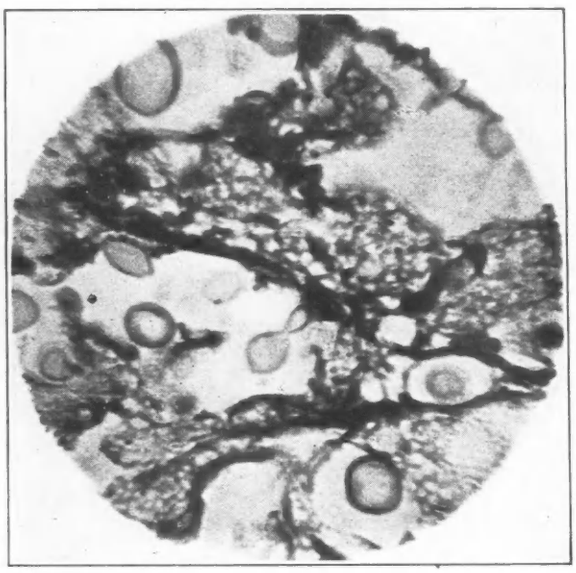

FIG. 3.—Some mature yeast forms in lung, one showing budding. (x 1350).

Yeast infection is relatively rare in man and for this reason, if for no other, the case reported is of interest. The organism present does not fall readily into any of the broad divisions of the yeast family and, admittedly, its identity could have been finally established only by means of cultures, which unfortunately were not secured. The tremendous variation not only in the size of the fungus but also in its structural characteristics is, to say the least, unusual, and the small forms are as typical of that stage as the large forms were characteristic in their peculiar arrangement.

This fungus was apparently of low pathogenicity, since it occurred only to a limited degree in a patient considerably under par in whom fairly extensive growth might have been expected once the organism had gained a foothold within the respiratory parenchyma.

BIBLIOGRAPHY

1. ASWORTH, *Trans. Roy Soc. Edin.*, 1922, **53:** 301.
2. CASTELLANI, *Am. Med.*, 1928, **34:** 289.
3. DARLING, *J. Am. M. Ass.*, 1906, **46:** 1283.
4. GUILLIERMOND AND TANNER, The Yeasts, John Wiley & Sons, New York, 1920.
5. MELLON, *J. Bact.*, 1926, **11:** 229.
6. STODDARD AND CUTLER, Torula Infection in Man, Monograph No. 6, Rockefeller Institute for Medical Research, 1916.
7. WELLER AND RIKER, *Am. J. Path.*, 1930, **6:** 721.

LEAD POISONING IN CHILDREN*

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LEAD poisoning is a subject which has received considerable attention from time to time, and one which is of medical interest not only from the standpoint of diagnosis but also from that of etiology. As the cases which are apt to receive more prominence are those in adults, and as lead poisoning is said to be an intoxication second in frequency only to alcoholism, it was thought that a brief presentation of two cases in young children would be of value. Plumbism in adults is nearly always due to occupational hazards. In children this is not so. The exposure is more subtle, the juvenile system reacts more severely to a much smaller exposure, and the manifestations of intoxication are different.

Except in rare instances of food-poisoning, lead is usually acquired as a manifestation of pica, that perverted appetite which leads children to indulge in ordinarily repulsive objects. Occasionally the habit becomes almost a mania, and the child will go to unthought-of lengths to satisfy its perversions. Usually, lead painted chairs, toys, and cribs are attacked, and the amount of paint which these children can remove from a crib in the space of half an hour of diligent concentration is remarkable.

The amount of lead required to produce

* From the Medical Department, Children's Memorial Hospital. Read before the Montreal Medico-Chirurgical Society, January 22, 1932.

clinical symptoms is apparently variable and difficult to determine, but in one of our cases, *viz.*, a two-year old child, relapse followed a three weeks' resumption of paint eating; and in the younger case presented the total duration of lead eating was probably six to eight weeks before the cerebral symptoms developed. The children are usually more or less irritable, but it is seldom that they complain of the colic that plays such a prominent part in the adult form. Constipation is almost invariably present, but seldom noticed or remarked upon by the parents, unless they are cross-questioned. There is usually some pallor; the lead line is frequently present, but less constantly than in adults. Peripheral neuritis develops in children, but there is less tendency to involve the shoulder muscles. The legs are more often attacked in children; most important, the cerebral manifestations are more frequent, and often abrupt in onset.

CASE 1

A girl, of 9 years, was referred as a case of poliomyelitis on account of wrist- and foot-drop. There was a history of colicky abdominal pains for several weeks, obstinate constipation, and, during the two weeks previous to admission, tenderness in the muscles, with increasing muscular weakness. There had been no muscular cramps in the extremities. She stumbled when she walked, and could not use her hands properly to feed herself. On admission the striking thing was bilateral foot-drop and wrist-drop. The peronei extensors of toes, and the tibialis anticus were paralyzed, but the supinator longus was active. It is uncommon, except in children, to see paralysis of the tibialis anticus. The mucous membranes were pale, the skin was pallid, and there was a very definite lead line on the gums. There were no cerebral symptoms, no optic neuritis, and no neck stiffness nor head retraction.

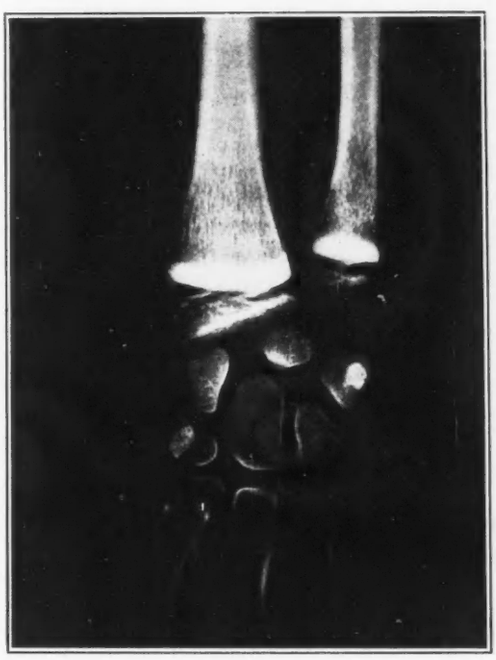

FIG. 1.—*Case 1.* Note the dense lines at the epiphyses of the radius and ulna. It is thought that the broader shadow indicates a longer exposure than in Fig. 2.

Blood examination.—Red blood cells, 3.7 millions; white blood cells, 7,200; hæmoglobin 73 per cent. Blood smears showed 3 to 4 stippled red cells in every field.

It was noted at the time that the hæmoglobin was actually much higher than it might have been estimated. The pallor of lead poisoning is a striking feature and said to be due to vaso-constriction of the skin vessels. Spinal puncture showed clear fluid under pressure of 150 mm. water, and 7 cells per mm. (lymphocytes).

The child was given calcium lactate by mouth, high-calcium diet and the feet and hands were put in cock-up splints. Later, massage was instituted. In six weeks definite recovery was in evidence and now (after three months) she has almost complete return of function in the hands. The feet, as is usual, are slower in recovering.

Urine.—Chemical analysis revealed the presence of lead in small quantities.

CASE 2

A female child, of three years, was referred to the hospital in generalized convulsions of sudden onset, following a period of a couple of weeks of general ill health, marked constipation, irritability, and projectile vomiting. During the last 36 to 48 hours she had developed a squint. This led the family physician to strongly suspect tuberculous meningitis; she was also quite pale and the question of a co-existing blood dyscrasia was raised.

On admission the child was semi-conscious, and when undisturbed lay on her side, with the head retracted, in a stuporous condition. Although there had been several convulsions during the day, none followed admission to hospital, in spite of the absence of immediate institution of specific treatment. There was marked pallor of the mucous membranes. Strabismus and definite stiffness of the neck were present and a questionable bilateral Kernig's sign. Bilateral papillœdema was also present. The knee-jerks, ankle-jerks and biceps-tendon reflexes were all present and slightly exaggerated. The abdominal reflexes were present. There was no Babinski sign. There was no paralysis of any muscles of the extremities. The only muscle paralyzed was the lateral rectus of the left eye. Examination of the heart and lungs was negative. The lymph-glands were not palpable. The bowel contained large palpable fecal masses. The liver and spleen were not palpable.

Blood examination.—Red blood cells, 3.4 million; white blood cells, 22,100; hæmoglobin, 50 per cent. A stained film showed anisocytosis, large numbers of stippled red cells, occasional normoblasts and myelocytes.

Lumbar puncture.—The fluid was clear; pressure, 170 mm. water; cells 200 per c.mm. all lymphocytes. Pandy's test for globulin was strongly positive. No organisms were found on smear or culture (including search for acid-fast organisms). The spinal fluid contained 154 mg. of total protein per 100 c.c. but did not give a positive test for lead.

An intradermal injection of O.T. (1 in 1,000), 0.1 c.c., was negative. In the meantime a faint but definite lead line was discovered on the gums. An x-ray taken to look for possible calcified abdominal lymph-glands showed none, but characteristic findings of plumbism at the ends of the ribs. X-rays of the epiphyses at the wrist revealed the same thing.

On questioning the parents, the source of the lead was found to be in eating furniture paint.

Improvement was continuous and rapid following

interruption of the paint-eating, the administration of a high-calcium diet, calcium lactate by mouth, and calcium gluconate intramuscularly. De-leading was later carried out by administration of NH_4CL and a low-calcium diet.

This case demonstrates that lead poisoning should always be borne in mind as a possible cause of convulsions of obscure origin.

The question of renal impairment is frequently raised in connection with lead poisoning. The younger child has not been investigated along this line, but the older child shows no evidence of disturbance by the Mosenthal test, although her urea concentration factor is lower than normal. She has no albuminuria.

FIG. 2.—*Case 2.* Note the dense lines at the epiphyses of the radius and ulna, on the left; normal x-ray of child same age on right for comparison.

In the last few years a further impetus to the study of plumbism was given by Park, Jackson and Kajdi,[1] and Vogt,[2] who described special changes in the ends of growing bones in cases of lead poisoning. In several proved cases of lead poisoning it was found that there was a broad dense area in the x-ray picture at the ends of the long bones.

Specimens from autopsy material which have been studied showed that there was four times as much lead in the dense areas as farther back in the shaft of the bone. It was also demonstrated by Park that in microscopical sections of the specimens in plumbism the trabeculæ are much more compact in these radiologically dense areas. Therefore, whether the radiological appearance is due to one or both causes is not yet definitely proved. Dense lines are found at the ends of growing bones in several conditions, notably healing rickets, scurvy and congenital syphilis. But as this is associated with other characteristic signs, there should be no confusion. The rare condition of marble-bone[4] should be borne in mind.

It is not claimed that these x-ray findings are characteristic of plumbism alone, as there is good reason to believe that other heavy metals, such as bismuth or arsenic, may produce similar effects, and it has been known for many years that phosphorus produces a somewhat similar picture. Nevertheless the discovery of such an x-ray appearance should raise the question of lead poisoning, especially in an otherwise normal bone; and its demonstration in a suspicious case may be regarded as confirmatory evidence.

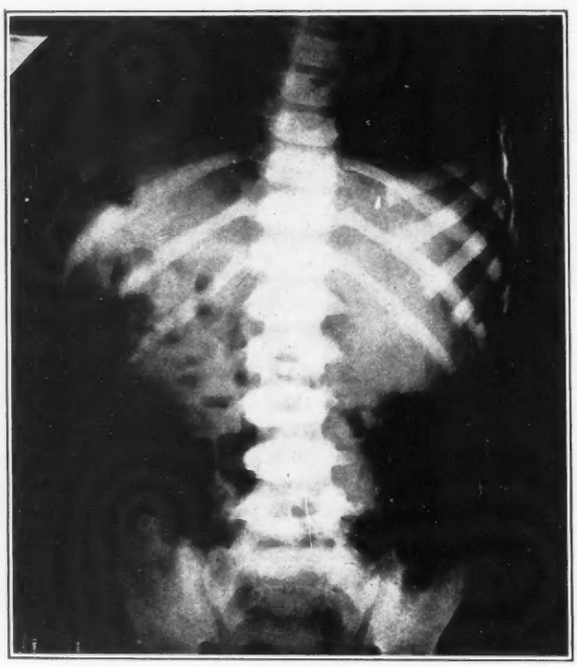

FIG. 3.—*Case 2.* Note the dense lines at the costochondral junctions on the right.

TREATMENT

For many years, in addition to magnesium sulphate by mouth and general dietetic and hygienic supervision, the most used drug was potassium iodide. Later sodium thiosulphate was introduced. Both these preparations very definitely increase the elimination of lead. But in the neurological crises, where there is already too much lead in the circulation it is obviously desirable to remove it rapidly. As shown by

Aub, Fairhall, Minot and Retznikoff,[5] the administration of a high-calcium diet, augmented by calcium lactate by mouth, or calcium chloride intravenously, rapidly removes the lead from the circulation and concentrates it in the bones. By this means the acute phase of the intoxication is easily controlled. Later on, when the acute symptoms have subsided, elimination may be proceeded with. This is accomplished by altering the pH of the blood, either by administration of acid or alkali; the same workers have shown that the combination of an acid salt (ammonium chloride) with a low-calcium diet gives the best results.

It is sometimes argued that if the lead can be satisfactorily stored in the bones, it should be left there, and the patient kept on a high-calcium diet or in a so-called positive calcium balance. As it has been so clearly shown experimentally, in addition to the clinical knowledge, that an acidosis may suddenly release into the circulation large quantities of lead, this temporizing may have serious results. In carefully controlled adults, theoretically, such a stand may be justifiable, but the frequency of acidosis in children, occurring either independently or in association with their many infections, leads one to feel that it is wiser to proceed with elimination of the lead in a quiescent interval than to run repeated risks of acute saturnism.

References

1. Park, Jackson and Kajdi, *Am. J. Dis. Child.*, 1931, **41**: 485.
2. Vogt, *Am. J. Roentgenol. & Rad. Therap.*, 1930, **24**: 550.
3. Vogt, *J. Am. M. Ass.*, 1932, **98**: 125.
4. Pirie, *Am. J. Roentgenol. & Rad. Therap.*, 1930, **24**: 147.
5. Aub, Fairhall, Minot, Retznikoff, *Medicine Monographs*, 1926, **7**: 265.

REGENERATION OF THE DISTAL PHALANX

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IT has been known for many years that the distal phalanx is able to regenerate following the removal of the diaphysis for osteomyelitis which has not involved the proximal, or epiphyseal, portion of the bone, or the interphalangeal joint. The number of cases, however, in which amputation is performed following osteomyelitis of this bone leads one to suspect that this ability to regenerate has either been forgotten by many of us, or that it has never been sufficiently emphasized. In this connection it is felt that the following case presents sufficient interest to warrant its presentation.

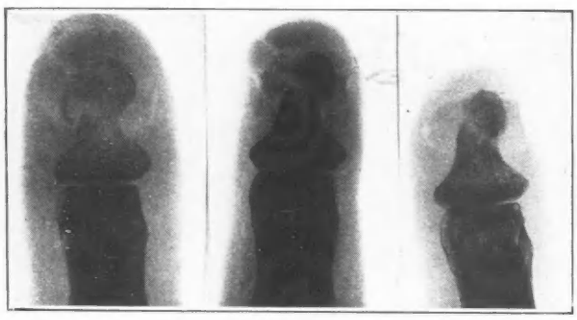
Case History

Dr. G. S., a House Surgeon of the Montreal General Hospital, received a slight injury by accidentally pricking the tip of the right middle finger with a safety pin on December 29th, 1930. He left for his home at some distance the same evening. A few days later the tip of the finger became inflamed, and, on his return to Montreal on January 6th, 1931, he was found to have a deep-seated felon with pus pointing beneath the nail. The finger was incised, but it was found that considerable damage to the bone of the distal phalanx had already occurred. The infective process did not subside, and on January 21st, x-ray examination showed that sequestration of the diaphysis had occurred. The interphalangeal joint, however, appeared to be intact. Operation was performed the following day, the diaphysis being removed. The cavity was swabbed out with alcohol and tightly packed with iodoform gauze soaked in sterile liquid paraffin. The inflammatory process promptly subsided, and on removal of the packing, four days later, a clean granulating cavity was found. The cavity was filled with liquid paraffin and its walls allowed to collapse. As the swelling of the finger subsided an attempt was made to mould the distal portion to its proper shape by means of adhesive strapping. X-ray examination, made on February 13th, showed that very definite bony regeneration was occurring. The moulding of the finger by means of adhesive straps was carried out at dressings done every three to six days. The finger was completely healed, so far as external appearances went, in about four weeks from the date of operation. X-ray examinations were made at intervals of three to four weeks for a number of months, to show the rate of bone formation. The finger was sufficiently firm to permit of some use in about five or six weeks. About March 5th he sustained a fracture through the newly formed terminal phalanx from too active use of the finger. This fracture is shown in x-ray dated March 6th, 1931. It healed promptly and without discomfort. The final x-ray examination was made August 11th, 1931. At this time the finger was causing practically no inconvenience. The nail had grown to about one-half its former length and the finger, although slightly shorter in its distal phalanx, was functionally almost as useful as formerly.

Fig. I

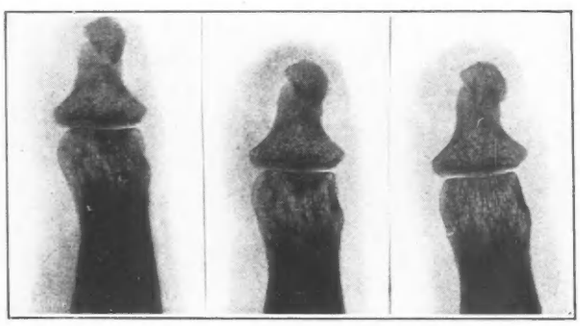
Jan 21/31 Jan. 24 Jan. 24 Lateral view

FIG. II



Feb. 13 Mar. 6 Mar. 28

FIG. III



April 28 May 28 Aug. 11

DISCUSSION

In the treatment of infections of the terminal phalanx, certain features of the anatomy, particularly the blood supply, should be borne constantly in mind. Even slight swelling and œdema of the very vascular area on the anterior aspect of the terminal phalanx, the so-called "closed space", may result in cutting off of the blood supply to the diaphysis by constriction beyond the distal transverse crease on the palmar surface of the finger. The escape of the epiphysis is accounted for by its having a separate artery of supply, which is given off sufficiently far proximally to avoid constriction. As has been elsewhere pointed out[1], this peculiar arrangement of its blood supply undoubtedly accounts for the early bone destruction which appears to occur much more quickly in the diaphysis of the terminal phalanx than elsewhere.

The function of the epiphysis in serving as a barrier to involvement of the interphalangeal joint, as well as its ability to preserve its regenerative powers, is very interesting. Careful x-ray examination should be made of every infection of this region before amputation is resorted to. The absence of destructive changes involving this joint should be regarded as a positive indication for conservative treatment.

The periosteum and its function in the regenerative process presents a field for study. It is the opinion of the writer that the periosteum covering the diaphysis receives at least a portion of its blood supply from the epiphyseal artery. This would account for its escape in a destructive process which frequently does so much damage to the soft tissues themselves as well as to the bone of the diaphysis. Whether or not the periosteum takes part in the regenerative process, or whether the actual growth is from osteogenetic cells immediately beneath it is, in this case as elsewhere, possibly a debatable subject. There is no doubt that in the present case the periosteum acted as a limiting membrane. There was, however, a failure in the development of bone at the site of the original injury, in which area there had been actual destruction of a portion of the periosteal covering.

In the experience of the writer the ultimate shape of the newly formed phalanx can be very markedly influenced by restoring and preserving the normal contour of the finger with adhesive strapping, and by the wearing of a curved "U" shaped splint over the end of the finger for at least three months following removal of the sequestrum. Protection of the tip of the finger from injury in this manner seems to permit the formation of an appreciably greater length of new bone. Apart from this very advantageous feature, the patient experiences a degree of comfort and sense of security which permits him to resume work several weeks earlier than he otherwise might.

REFERENCE

1. MCKIM, *Canad. M. Ass. J.*, 1930, **23:** 642.

THE DANGERS OF USING IMPURE MUCIN IN TREATMENT OF PEPTIC ULCERS.—Rivers, Vanzant and Essex have demonstrated in certain specimens of commercial mucin the presence of large amounts of a secretagogue which by biological tests seems to be histamine. The presence of this substance may be looked on as a contaminant which can be avoided if proper methods of preparation are used. Until a consistently standardized, pure product is supplied, it will be impossible to evaluate the therapeutic use of mucin.—*J. Am. M. Ass.*, 1932, **98:** 1156.

THE INFLUENCE OF INFECTION UPON THE REACTION OF THE DIABETIC TO INSULIN TREATMENT

(REPORT OF AN UNUSUAL CASE)*

BY I. M. RABINOWITCH

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THE possible unfavourable influences of infection upon the course of diabetes are generally recognized. Of all the conditions which tend to lower carbohydrate tolerance, infection stands at the head of the list with respect to frequency and capacity to do harm. Loss of carbohydrate tolerance is apparently not related to the severity of infection; according to the writer's experience, a small furuncle, or the ordinary "cold", has, at times, resulted in as much disturbance as was found with more severe infections (pneumonia, etc.). Most disturbing, at times, from the point of view of effective therapy, is the fact that in infection not only may the supply of insulin produced in the body (endogenous insulin) be reduced, but that which is administered hypodermically may also be ineffective. Blood-sugar-time curves obtained after the hypodermic injection of insulin demonstrate this phenomenon. A series of such curves were first reported by the writer in 1924[1]. The most striking result was obtained in a case of infected gangrene of one of the extremities with septicæmia (Case No. 3938). One hundred units of insulin were given with the following results:—

Time	*Blood sugar Per cent*
Before administration of insulin	0.357
1 hr. after " " "	0.344
1 " " " " "	0.333
3 " " " " "	0.285
4 " " " " "	0.302

In spite of the large amount of insulin given, it will be noted that the decrease of blood sugar was not only very slow, but very temporary; it began to increase again at the end of four hours.

Fever alone appears to be an influencing factor. This is shown in a case of infected gangrene in which fever was still present after removal of the source of infection (amputation). Thus, (Case No. 4260/23):—

Before operation, Temp. 101°.

Time	*Blood sugar Per cent*	
Before administration of insulin	0.285	Insulin 20 units
1 hr. after " " "	0.250	
2 " " " " "	0.251	
3 " " " " "	0.252	

Two weeks after operation, Temp. 102.1°.

Time	*Blood sugar Per cent*	
Before administration of insulin	0.285	Insulin 20 units
1 hr. after " " "	0.210	
2 " " " " "	0.212	
3 " " " " "	0.212	

It will be noted that though there was some hypoglycæmic response to the injection of the insulin after operation it did not by any means correspond to that usually noted in uncomplicated diabetes. In the absence of fever hypoglycæmia is, as a rule, very rapidly produced. Thus, (Case No. 146/24):—

Before operation, Temp. 102.4°.

Time	*Blood sugar Per cent*	
Before administration of insulin	0.385	Insulin 20 units
1 hr. after " " "	0.332	
2 " " " " "	0.278	
3 " " " " "	0.277	

Two weeks after operation, Temp. 98.2°.

Time	*Blood sugar Per cent*	
Before administration of insulin	0.196	Insulin 20 units
1 hr. after " " "	Missed	
2 " " " " "	0.097	
3 " " " " "	0.036	Hypoglycæmic reaction.

That infection is the dominant factor is, however, suggested from the findings in a case of suppuration without fever. Thus, (Case No. 5951/23).

Temp. 98.4°.

Time	*Blood sugar Per cent*	
Before administration of insulin	0.526	Insulin 60 units
1 hr. after " " "	0.500	
2 " " " " "	0.476	
3 " " " " "	0.500	
4 " " " " "	0.501	

Though no other study of blood sugar time curves appears to have been made, so far as could be ascertained, there is now a large literature

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on this subject otherwise. The importance of seeking for foci of infection during examination of the diabetic, and the satisfactory results of treatment of such foci, have been emphasized repeatedly. It has often been observed that after removal of these foci (tonsils, teeth, etc.), not only was it possible to increase the diet without increase of insulin but, at times, the latter could be decreased or discontinued entirely. Infection also interferes with the usual method of calculating insulin dosage. Based upon early experiences with insulin, the writer stated[1] that " . . . . in the presence of infection, no routine course can be followed in establishing the dosage of insulin. Enormous doses may be required. The amount and frequency of administration during the emergency period is best determined by the frequent (hourly, if necessary) estimation of the blood sugar". This rule, at least in our experience, still holds.

The mechanism whereby infection causes loss of carbohydrate tolerance and interferes with the action of injected insulin is still unknown. There are many theories. From our own data it would appear that the blood of diabetics with infection contains an insulin-destroying enzyme. Newer methods of treatment based upon this assumption have been attempted. The results obtained in diabetics with infection and in non-diabetics who had non-healing surgical wounds and blood sugar and respiratory quotient time curves which indicated disturbed carbohydrate tolerance have, at least so far, been satisfactory. However, this phase of the subject is still very much in the experimental stage.

Recovery of carbohydrate tolerance after removal of infections is, as stated above, a common experience. An unusual case was, however, met with recently. As far as could be ascertained, no similar experience has been reported. Briefly, the findings were as follows:—

A white male (No. 4461/31), age 64 years, was admitted to the Service of Dr. C. P. Howard on August 8th, 1931, in a state of pre-coma. Drowsiness was marked; the breathing was of the "deep laboured" type; the tongue was dry and beefy in appearance and yielded the sandpaper like sensation on palpation; the eyeballs were soft and there was a marked acetone odour to the breath. In addition, the urine contained large amounts of sugar and acetone bodies, albumin and casts. The blood sugar was 0.588 per cent. Fifty units of insulin were administered subcutaneously followed by twenty units every four hours. The following morning, clinical signs of severe acidosis were absent. The urine still contained sugar and acetone bodies, but these findings could readily be explained by the "residual" urine in the bladder. The blood sugar was normal, namely, 0.112 per cent.

The history then obtained from the patient was that the diabetes was first discovered in 1928. He came to the out-door department of this hospital on January 12th, 1928, complaining of loss of weight, thirst, fatigue and polyuria of one month's duration and failing vision. At that time, he was regarded as a mild diabetic with cardio-vascular-renal disease; there were albuminuria, hypertension and cardiac hypertrophy. He was then given dietetic treatment only. Two weeks later (January 26th), the urine was free of sugar and acetone bodies. He did not return to the clinic until his present admission in the state of pre-coma. Though he followed his prescribed diet very irregularly, he was apparently well until April of this year, when he, again, developed thirst and polyuria and began to lose weight rapidly. In May, he weighed about 230 pounds and his weight obtained three days after admission was 190 pounds. He, therefore, lost approximately forty pounds in three months.

In addition to the cardio-vascular-renal features noted in 1928, there were now marked optic neuritis with a few retinal hæmorrhages and slight retinal œdema in the left eye. The right showed a few retinal exudates only. Our routine x-ray examination showed marked calcification of the arteries of the feet. There was, also, a chronic rhinitis, but no pus in the nose or naso-pharynx and there were no clinical signs of sinusitis. The tonsils were small and atrophied. According to the x-ray findings, there was no evidence of infection in any of the nasal accessory sinuses.

Following our usual treatment of coma, the food for the first forty-eight hours was restricted to water, clear, fat-free and well salted broth, tea and coffee and orange juice; the equivalent of about ten grams of carbohydrate was given with each dose of insulin. During the first twenty-four hours, twenty units of insulin were given every six hours and, on the second day, twenty units were given every eight hours. On the third day, August 11th, dietetic treatment was instituted. The patient was given the high-carbohydrate low-fat diet on a "ladder" basis and twenty units of insulin twice a day, one-half hour before the morning and evening meals. The course of events is shown in the accompanying table. It will be noted that the urine was free of sugar and acetone bodies throughout the entire course of the "ladder" period. It will, also, be noted that there was a high renal threshold for glucose; in spite of a blood sugar of 0.237 per cent on August 13th, the urine contained no sugar. A number of conditions could account for this phenomenon in this case, namely, the arteriosclerosis, infection (cystitis), nephritis, and the gross dietary indiscretions prior to admission.

On August 20th, twelve days after admission, the urine was free of sugar and acetone bodies, and the blood sugar showed only a very mild hyperglycæmia, in spite of the fact that the diet consisted of 218 grams of carbohydrate, 45 grams fat and 69 grams protein. On this day, because of the cystitis with pyuria, a cystoscopic examination was made. Our urologist reported enlargement of the prostate with the common accompanying local changes in the bladder and recommended supra-pubic prostatectomy, providing the diabetes could be controlled and the patient was a good operative risk otherwise. The course of events was uneventful until September 1st. It will be noted that the urine was always free of sugar and acetone bodies, and the blood showed only very mild degrees of hyperglycæmia.

On September 1st, the first operation (cystotomy) was performed under local anæsthesia. According to our usual practice in operative cases, the insulin dosage was given no more in relationship to meals but every eight hours. It has repeatedly been found that it is possible to reduce the dose of insulin by giving small amounts at frequent intervals. It will, therefore, be noted that the insulin was reduced from forty units to thirty units a day. In spite of this, the urine remained free of sugar and acetone bodies and the subsequent blood sugar was normal or nearly normal. On September 11th, the second operation (enucleation of prostate) was performed. Ether anæsthesia was used, because of the restlessness of the patient. Again, the post-operative course was uneventful, with the exception of a slight febrile reaction for the following forty-eight hours. The diet remained the same. On September 19th, the insulin dosage was reduced to twenty units and divided into two doses—ten units were given before the morning and ten units before the evening meals. In view of the subsequent blood and urinary

findings, the insulin was further reduced on September 24th to ten units once a day only, and on September 27th it was discontinued entirely. The subsequent course of events are shown in the table. It will be noted that the urines remained free of sugar and acetone bodies and the blood sugar remained normal.

The patient was discharged from the hospital on October 7th, 1931. Since his discharge he has been attending the out-door clinic for diabetes. The latest available data show that the urine was free of sugar and acetone bodies and the blood sugar was perfectly normal, namely, 0.112 per cent. He felt and looked well. The body

TABLE

PROGRESS OF PATIENT FOLLOWING RECOVERY FROM A STATE OF PRE-COMA.

Date	Urine		Blood Sugar*	Diet			Insulin (Units)	Remarks
	Sugar	Acetone		COH	Fat	Prot.		
Aug. 11	0	0		56	45	42	20/0/20	Insulin given before meals. Cholesterol 0.302 per cent.
12	0	0		74	"	45	" " "	
13	0	0	0.237	92	"	48	" " "	
14	0	0		110	"	51	" " "	
15	0	0	0.200	128	"	54	" " "	
16	0	0		146	"	57	" " "	
17	0	0	0.188	164	"	60	" " "	
18	0	0	0.117	182	"	63	" " "	
19	0	0		200	"	66	" " "	
20	0	0	0.143	218	"	69	" " "	Cystoscopic examination.
21	0	0		"	"	"	" " "	
22	0	0	0.125	"	"	"	" " "	
23	0	0		"	"	"	" " "	
24	0	0		"	"	"	" " "	
25	0	0	0.137	"	"	"	" " "	Cholesterol 0.192 per cent.
26	0	0		"	"	"	" " "	
27	0	0		"	"	"	" " "	
28	0	0	0.122	"	"	"	" " "	
29	0	0		"	"	"	" " "	
30	0	0		"	"	"	" " "	
31	0	0	0.139	"	"	"	" " "	
Sept. 1	0	0	0.140	"	"	"	Insulin	Supra-pubic cystotomy.
2	0	0	0.091	"	"	"	given	Local anæsthesia.
3	0	0		"	"	"	every	
4	0	0	0.117	"	"	"	eight	
5	0	0		"	"	"	hours,	
6	0	0		"	"	"	ten units	
7	0	0		"	"	"	" "	
8	0	0	0.126	"	"	"	" "	
9	0	0		"	"	"	" "	
10	0	0	0.143	"	"	"	" "	
11	0	0		"	"	"	" "	Enucleation of prostate.
12	0	0	0.140	"	"	"	" "	Ether anæsthesia.
13	0	0		"	"	"	" "	
14	0	0	0.117	"	"	"	" "	Slight febrile reaction.
15	0	0		"	"	"	" "	" " "
16	0	0	0.105	"	"	"	" "	
17	0	0		"	"	"	" "	
18	0	0		"	"	"	" "	
19	0	0	0.117	"	"	"	10/0/10	Insulin given before meals.
20	0	0	0.143	"	"	"	" " "	
21	0	0	0.137	"	"	"	" " "	
22	0	0		"	"	"	" " "	
23	0	0	0.114	"	"	"	" " "	
24	0	0		"	"	"	10/0/0	
25	0	0		"	"	"	" " "	
26	0	0	0.098	"	"	"	" " "	
27	0	0		"	"	"	0	Insulin discontinued.
28	0	0	0.111	"	"	"		
29	0	0		"	"	"		
30	0	0		"	"	"		
Oct. 1	0	0	0.101	"	"	"		
2	0	0		"	"	"		
3	0	0	0.106	"	"	"		
4	0	0		"	"	"		
5	0	0		"	"	"		
6	0	0		"	"	"		
7	0	0		"	"	"		Discharged.

*All analysis made on blood obtained in fasting state.

weight was 187 pounds—practically identical with that on discharge from the hospital. He is still on the high-carbohydrate low-fat diet.

SUMMARY

To summarize, a male 64 years of age with a history of diabetes of three years' duration and with the disease complicated by cardio-vascular-renal disease and prostatic enlargement with cystitis and pyuria was admitted to the hospital in a state of a pre-coma. Following the usual treatment of this condition, he was given a high-carbohydrate low-fat diet, and about three weeks after admission was exposed to a cystotomy and eleven days later to enucleation of the prostate. In spite of the advanced stage of the diabetes on admission and exposure to the injury associated with these two operations, including ether anæsthesia, it was possible to discontinue the use of insulin entirely before the patient left the hospital, though the carbohydrate content of the diet was over 200 grams. Though improvement of carbohydrate tolerance is not an uncommon phenomenon following recovery from conditions which tend to lower tolerance, it has usually been noted in relatively mild diabetes. In our experience, this is the first case associated with the disease when the condition has reached the stage of coma. Of additional interest is the fact that this patient was treated with the high-carbohydrate low-fat diet.

REFERENCE

1. RABINOWITCH, *Canad. M. Ass. J.*, 1924, 14: 481.

CAVITY FORMATION IN ITS RELATION TO PROGNOSIS AND TREATMENT IN PULMONARY TUBERCULOSIS

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THIS study was undertaken in December, 1930, in an effort to determine the influence of persistent cavity upon prognosis in cases of pulmonary tuberculosis. The group studied comprised all admissions to one division of the Mountain Sanatorium, Hamilton, in the year 1928. This group was selected because:—(1) the increased use of repeated x-ray films in this year made it possible to compare the x-ray picture of the lesion on starting treatment with the appearance of the lesion after some months of sanatorium treatment; and (2) because F. H. Heise and Lawrason Brown[1] have shown that the majority of deaths from moderately and far advanced pulmonary tuberculosis occur within two years of the clinical onset of the disease.

A list of all admissions was made and cases on this list were excluded from the present study if the diagnosis of pulmonary tuberculosis could not be confirmed either by sputum examination or x-ray, or both, or if a second x-ray was not available after three months or more for study in patients who survived. After the list had been revised in this way an effort was made to get in touch with all remaining patients, many of whom had left the institution. Letters were written to each of these, asking for the following information:—(a) usual evening temperature; (b) presence or absence of cough and sputum; (c) extent of physical activity at present; (d) gain or loss of weight; (e) subjective sense of well being or easy fatigability; (f) any other information thought relevant.

On receipt of this information, which was in most cases generously given, the present condition of all patients was classified. Patients who failed to respond to the letters were excluded from further study. The classification adopted with regard to extent of disease and degree of activity was that of the National Tuberculosis Association. In most cases the x-ray films were originally read by another member of the Sanatorium Staff, but the present writer studied each x-ray film himself and used the original reading only as a check.

Considerable difference of opinion will always exist in the interpretation of x-ray appearances as cavities. In the present reading of the films areas of rarefaction of somewhat definite outline were taken as more or less definite indication of the presence of cavity; and physical signs, as recorded at the time the x-ray was taken, were taken into consideration in the interpretation of doubtful cases. Ring shadows of doubtful significance were not considered to indicate cavity, unless cavity was suggested by physical signs.

As a matter of fact, this difficulty occurred only twice in the series. The whole series studied is classified as follows:—

TABLE I.

SUMMARY OF SERIES STUDIED

No. of Cases	*Died*	*Unimproved*	*Per cent Dead or Unimproved*	*Improved*	*Quiescent*	*Apparently Arrested*	*Cases with Tuberculous Complications*	*Per cent with Tuberculous Complications*
103	41	4	44	10	18	30	39	38

The mortality figured in the preceding table is higher than is actually the case in the total of 1928 admissions, because, of course, incomplete information about the living patients caused the exclusion of some from the series studied.

In the far advanced C group, death often occurred before complications developed or were capable of being diagnosed. From the accompanying tables one concludes that:—

(1) The degree of activity is a more important prognostic sign than the extent of the disease; (2) the incidence of complications increases both with the degree of activity and with the extent of disease but especially with the former.

TABLE II.

CLASSIFICATION BY ACTIVITY AND EXTENT OF DISEASE

ACTIVITY - A

Classification	*No. of Cases*	*D.*	*U.*	*Per cent Dead or Unimproved*	*I.*	*Q.*	*App. Arr.*	*Cases with tuberculous complications*	*Per cent with complications*	*Remarks*
F.A.....	12	2	0	15	2	2	6	2	15	1 death of thoracoplasty.
M.A.....	13	0	0	0	0	4	9	1	8	2 of these M.A. (Q).
Min.....	6	0	0	0	0	0	6	0	0	
Total..	31	2	0	6	2	6	21	3	10	

ACTIVITY - B

Classification	*No. of Cases*	*D.*	*U.*	*Per cent Dead or Unimproved*	*I.*	*Q.*	*App. Arr.*	*Cases with tuberculous complications*	*Per cent with complications*	*Remarks*
F.A.....	29	7	3	34	3	10	6	14	48	
M.A.....	8	1	0	14	2	2	3	2	25	
Min.....	0	0	0	0	0	0	0	0	0	
Total..	37	8	3	30	5	12	9	16	45	

ACTIVITY - C

Classification	*No. of Cases*	*D.*	*U.*	*Per cent Dead or Unimproved*	*I.*	*Q.*	*App. Arr.*	*Cases with tuberculous complications*	*Per cent with tuberculous complications*
F.A.....	33	30	1	94	2	0	0	18	55
M.A.....	2	1	0	50	1	0	0	2	100
Total....	35	31	1	91	3	0	0	20	57

D.—Dead; U.—Unimproved; I.—Improved; Q.—Quiescent; App. Arr.—Apparently Arrested; F.A.—Far Advanced; M.A.—Moderately Advanced; Min.—Minimal.

The series is grouped below in a different way to bring out the effect of cavity formation on prognosis. An attempt was made to divide the cases, according to the degree of cavitation, into three classes:—(a) no cavity formation; (b) cavity in one anterior interspace only (on x-ray film); (c) cavity in two or more interspaces. It is realized that this is a rough and arbitrary system of classification but it represents the best one could devise. The system makes no allowance for the probability that a cavity extending through two interspaces will indicate a poorer prognosis than a small cavity in each of two widely separated interspaces, but the question of the size of the cavities is discussed later in this paper. A cavity that was so placed behind a rib that it projected into two interspaces was classed as a "one interspace cavity", if it was obviously small enough to fit into one interspace.

In these tables the cases of C class activity are omitted from consideration because:—(a) the bad outcome in this class in the present study overshadows all other considerations; (b) it is impossible to discuss the extent of cavitation in relation to prognosis when the extent of cavitation is changing as rapidly as it does in this type of case; (c) C class cases nearly all have cavities, or eventually develop them.

The data comprising Table III are rearranged in the Table IV, taking into account the extent and activity of the disease and omitting minimal cases.

From the groupings below one concludes

TABLE III.

CLASSIFICATION BY EXTENT OF CAVITY FORMATION ON ADMISSION

Classification	*No. of Cases*	*D.*	*U.*	*Per cent Dead or Unimproved*	*I.*	*Q.*	*App. Arr.*	*Per cent with tuberculous complications*
Cavity in 2 or more interspaces..	33	8	2	30	5	10	8	36
Cavity in 1 interspace only.....	20	1	1	10	3	6	9	16
No cavity.....	15	1*	0	7	0	2	12	7

*This patient left the sanatorium against advice.

TABLE IV.

(*a*) *Far Advanced A and B.*

Classification	*No. of Cases*	*D.*	*U.*	*Per cent Dead or Unimproved*	*I.*	*Q.*	*App. Arr.*	*Per cent with tuberculous complications*
Cavity in 2 or more interspaces..	31	8	0	26	5	10	8	34
Cavity in 1 interspace only.....	7	0	1	14	0	2	4	14
No cavity.....	1*	1						
Totals.....	39	9	1	26	5	12	12	32

*This case left sanatorium against advice.

(*b*) *Moderately Advanced A. B. and C.*

Classification	*No. of Cases*	*D.*	*U.*	*Per cent Dead or Unimproved*	*I.*	*Q.*	*App. Arr.*	*Per cent with tuberculous complications*
Cavity in 1 interspace only.....	13	1	0	8	2	4	6	15
No cavity.....	8	0	0	0	0	2	6	12
Totals.....	21	1	0	5	2	6	12	14

that:—(1) irrespective of the extent of the pulmonary disease, the extent of cavitation has a definite bearing upon prognosis, in that the greater the extent of cavitation the poorer the prognosis; (2) the prognosis of cases with cavitation limited to one interspace is much more favourable than in cases with more extensive cavitation.

THE SIGNIFICANCE OF POSITIVE SPUTUM

The persistence of positive sputum is well recognized as of rather grave significance in prognosis. Prognosis becomes particularly interesting in that group of patients who survive the acute onslaught of their disease and live two years or more. Accordingly, the following tables were prepared to compare the results of treat-

TABLE V.

RELATION OF CAVITY TO POSITIVE SPUTUM AND TO RESULT OF TREATMENT IN PATIENTS STILL LIVING 2 TO 3 YEARS AFTER ONSET OF DISEASE.

(*a*) *Living patients with no cavity demonstrable at any time:*

Sputum	*No. of Cases*	*Un-improved*	*Improved*	*Quiescent*	*App. Arr.*	*Per cent quiescent or apparently arrested*
Negative throughout	10	0	0	2	8	100
Formerly positive, negative at last 2 examinations	3	0	0	1	2	100
Positive in at least 1 of last 2 examinations	0	..	..	..	..	
Totals	13	0	0	3	10	100

(*b*) *Living patients with cavity closed at last examination:*

Sputum	*Cavity on admission in*		*No. of Cases*	*U.*	*I.*	*Q.*	*App. Arr.*	*Per cent quiescent or apparently arrested*
	2 or more interspaces	*1 interspace only*						
Negative throughout	1*	2	3	0	1	1	1	67
Formerly positive, negative at last 2 examinations	8	5	13	0	0	5	8	100
Positive in at least 1 of last 2 examinations	0	0	0	..	..	..	..	..
Totals	9	7	16	0	0	6	9	94

*This patient has cavities collapsed by pneumothorax and is a hysterical girl whose unstable nervous system has greatly interfered with her recovery. She is classed as "improved" and somewhat spoils the impressive showing of this group.

(*c*) *Living patients with cavity still open at last examination:*

Sputum	*Cavity on admission in*		*No. of Cases*	*U.*	*I.*	*Q.*	*App. Arr.*	*Per cent quiescent or apparently arrested*
	2 or more interspaces	*1 interspace only*						
Negative throughout	0	0	0	..	..	..	..	..
Formerly positive, negative at last 2 examinations	7	3	10	0	0	4	6	100
Positive in at least 1 of last 2 examinations	8	2	10	2	5	3	0	30
Totals	15	5	20	2	5	7	6	65

ment in three classes of patients still living:—(a) those who never had demonstrable cavities; (b) those whose cavities appeared to be closed before discharge; (c) those whose cavities remained open at the last examination.

The presence or absence of positive sputum is also set forth in the tables in each class of patients.

In the above series of Tables only 49 patients are classified. Of the original series comprising this study 62 are living, but as the x-rays in 13 had not been repeated recently one could not judge whether the cavities had closed or not. Accordingly, only the remaining 49 could be analyzed above.

From this arrangement of data one concludes as follows:—

(a) The patient discharged with a healed cavity has as good a prognosis or at any rate is as well two or three years after the onset of his disease as the patient who never had a demonstrable cavity.

(b) It is possible for the sputum to be negative repeatedly in the presence of cavities apparently demonstrable by x-ray in proved cases of tuberculosis. (In the 10 patients of the last table who have negative sputum with persistent cavity, the sputum had been negative on the average for eight consecutive examinations.)

(c) Even if the x-ray shows a persistent cavity, if the sputum is constantly and repeatedly negative the prognosis seems to be as good as if no cavity were present.

(d) The presence of positive sputum in most cases is associated with demonstrable cavity formation. It probably means cavity formation in nearly all cases. When healing of a cavity occurs the sputum becomes negative.

(e) The poor prognostic significance of persistently positive sputum is plain.

(f) The above data suggest that the chief aim in treatment should be the closure of cavities.

CLOSURE OF CAVITIES

It will be noted that in the above table 36 patients are listed as having cavity and that in 16 of these the cavities became healed. Of these 16, six received some form of collapse therapy with resulting closure of cavity. But in 10 cases, the cavities closed without this measure. In these 10 cases the x-ray appearance of the cavity was as follows:—

"Poorly outlined area of rarefaction about one-half inch in diameter"—5 cases.

"Multiple, small, ill-defined areas of rarefaction, the largest about one-half inch in diameter"—1 case.

"Well defined area of rarefaction about one-third inch in diameter in an area of recent disease"—1 case.

"Annular shadow two and one-half inches in diameter with fluid level. Possibly not a cavity"—1 case.

"Poorly outlined area of rarefaction three-quarter inch in diameter"—1 case.

In the remaining case the film was mislaid and a measurement cannot be given.

In the 20 patients whose cavities remained open none are now receiving pneumothorax, though pneumothorax was tried for a time in 3 cases. In all these cases the cavity wall was either well outlined, and of some density to begin with, or became so later on.

In the series of 10 unclosed cavities with persistently negative sputum, the cavities had all decreased in size on x-ray examination. The largest cavity in this group originally measured one and three-eighths inches by one inch on the x-ray plate, and shrank to three-eighths of an inch in diameter.

PROGNOSIS IN CASES WITH CAVITY BUT NEGATIVE SPUTUM ON DISCHARGE

It seemed strange to the writer that cases with persistent cavity even with several negative sputum examinations, should be apparently in as good shape as cases with no, or with closed, cavity. Accordingly, all cases *discharged* from the institution in 1927 were reviewed and 25 cases were found who had had repeated x-ray examination of the chest and whose last examination had shown the appearance of a persistent cavity. Letters were sent to all of these not still under observation, in an effort to learn their present condition. The results of the survey in 20 cases in which information was secured are summarized in Table VI.

The one death in the group of 7 with supposedly negative sputum was in a patient whose sputum became consistently positive within a short time of leaving the hospital. The impression obtained from the first survey is confirmed by this one, that persons with x-ray evidence of cavity, but persistently negative sputum, should not be given a bad prognosis on discharge. The persistence of positive sputum on the other hand is a sign of poor prognostic import. Even the two cases with positive sputum, marked "quiescent"

TABLE VI.

RESULTS OF TREATMENT IN CASES WITH OPEN CAVITIES DISCHARGED IN 1927

Sputum on Discharge	*No. of Cases*	*Died*	*Unimproved*	*Improved*	*Quiescent*	*Apparently Arrested*
Positive.....	13	5	2	3	2	1
Negative in at least last 2 examinations	7	1	0	0	3	3
Totals.....	20	6	2	3	5	4

above, are still under treatment and are unable to work.

SUMMARY

A group of patients is analyzed in this article in an effort to assess the influence of cavity formation upon prognosis. Particular attention is given to the group living two years after the onset of their disease. In this group the presence of cavity is discussed in relation to the occurrence of positive sputum, and both factors (cavity and sputum) are discussed in their relation to prognosis.

CONCLUSIONS

1. In cases with positive sputum a cavity can usually be demonstrated by x-ray. As this heals, the sputum usually becomes negative. Therefore, if a cavity is present in the lung and the disease is active and sputum is negative, this is strong evidence against the disease being tuberculosis.

2. In subacute or chronic tuberculosis the presence of a small cavity (one-half inch) in one interspace on admission does not make much difference in prognosis. Larger cavities do considerably increase the gravity of the prognosis.

3. Ill-defined single cavities, if one-half inch to three-quarter inch in diameter, have a strong tendency to heal without collapse therapy.

4. Well defined cavities and cavities with heavy walls rarely heal without collapse therapy.

5. The prognosis becomes increasingly poor in proportion to the *degree of activity*, the *extent of cavitation*, and the *extent of disease*. Of these the degree of activity is much the most important. The absence of cavitation is of more significance than its extent when present.

6. Cases with cavities closed on discharge have as good an outlook, for the immediate future at least, as cases who never had cavities.

7. Even if cavities persist, if the sputum is persistently negative the prognosis, for a few years, at least, is favourable. One should probably not do thoracoplasty on this type of case. If cavities are large, the sputum is very unlikely to be consistently negative.

8. In an occasional case the presence of positive sputum is compatible with good health over considerable periods of time.

9. Pneumothorax and phrenicotomy are usually unnecessary if no cavity is present or thought likely to form, especially if the sputum is consistently negative.

REFERENCE

1. HEISE AND BROWN, *Tubercle*, 1925, **6**: 227.

GASTRIC MUCIN IN THE TREATMENT OF PEPTIC ULCER.—A. J. Atkinson treated 43 patients with history, signs, symptoms, laboratory evidence and roentgen manifestations of peptic ulcer with mucin. The patients were chosen because all the evidence concurred in the diagnosis. The therapeutic dosage of mucin totaled 90 gm. a day, but three patients received as much as from 150 to 238 gm. a day in a study of the effect on the gastric acidity. Ewald, fractional and motor test meals were given, and the stools examined for occult blood. The "acid test" as suggested by Palmer was used at first and later modified to coincide with Hardy's technique. The 43 patients in the series became symptom-free within an average period of 1.7 days. The types of ulcers treated in the series are tabulated. The average duration of ulcer history, which was 5.2 years, indicates the marked chronicity of the ulcer diathesis in this group. Eighteen of the patients were awakened by pain suggesting gastric retention or continued secretion. Thirty-five of the patients in the series had previous medical management, spending a total of 208 weeks in hospitals, an average of 5.9 weeks per patient. All obtained relief on mucin with a total of twenty-five weeks of hospitalization, an average of 0.71 week per patient. Fifteen, having distress while on medical management when first seen, were continued ambulatory and obtained complete relief with mucin. Although any form of therapy may bring about a remission, there is no doubt that remarkable results have been obtained in patients who were previously having distress on dietary or alkali management. The time of observation has been too short to prove that the improvement is permanent in a disease in which the natural history is so variable. The author feels fully justified in believing that mucin treatment is conducive to healing.—*J. Am. M. Ass.*, 1932, **98**: 1153.

THE TREATMENT OF URETERAL CALCULI WITH ANALYSIS OF TWO HUNDRED CASES

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THE treatment of ureteral calculi has changed to a remarkable extent during the past fifteen years and the indications for the type of treatment to be used—whether operative or non-operative—are now quite definite.

The following analysis is based on a series of 200 consecutive cases of ureteral calculi treated during the period 1925 to 1930. The treatment is best described under the following headings:—(1) immediate; (2) quiescent interval; (3) after-treatment.

Immediate Treatment

The passing of a calculus down the ureter is probably the most painful process to which the human being is subjected. It comes usually like a bolt out of the blue and constitutes a real emergency. The diagnosis having been made by history and physical examination (blood in the urine is such an aid), the first step in the treatment is alleviation of the pain. This is accomplished by the liberal administration of morphine. One-half grain of morphine is given hypodermically, in an adult, and may have to be repeated in half an hour. Amytal, grs. vi to ix, by mouth, proves very efficient as an adjunct. If the pain is not relieved in a few minutes the patient is placed in a bath of water as hot as he can stand, and while in the bath the temperature is raised to the limit of toleration. The heat has a wonderfully relaxing effect, almost equal to morphine. The pain can almost always be controlled by a combination of these methods, but in the few cases in which this form of treatment is not successful the insertion of an ureteral catheter beyond the calculus controls the pain.

The most serious complication that may occur at this stage is calculous anuria. This demands immediate and efficient treatment. Bilateral ureteral catheterization should be done, and if the anuria persists for more than twenty-four hours a bilateral pyelotomy must be performed. The mortality risk in this operation increases with every hour of anuria. No cases of anuria occurred in this series.

The Quiescent Period

Following the control of pain a complete urological study should be made, for the type of treatment now depends upon many factors. The calculus must not remain in the ureter for a long period, as kidney destruction will ultimately follow. Each case presents its own problem, and no one form of treatment is all-sufficient. In making the decision as to the method of treatment common sense must be employed. The situation, size and number of calculi must be definitely determined. The presence or absence of infection and the amount of kidney damage is estimated. Any obstructive factor is discovered, and, last but not least, the general condition of the patient is studied. If the kidney above the calculus is destroyed by infection, hydronephrosis or renal calculus, a nephrectomy or nephroureterectomy is performed, provided the other kidney is normal.

When the ureteral calculus is the main pathological condition present and no gross destruction has occurred above it, in about 75 per cent of cases the calculus may be removed by cystoscopic treatment. In the remaining 25 per cent of cases an operation is necessary. The indications as to whether the calculus is to be treated by either operative or manipulative measures are usually very definite.

The following four points place the case in the operative procedure group:—(a) inability to mobilize the calculus after two or three attempts; (b) size—if the calculus is more than 1 cm. in diameter; (c) acute pyelonephritis; (d) a solitary kidney.

If, after two or three ureteral dilatations, the calculus does not move, further attempts are unlikely to be successful and may result in more damage than that caused by operation. If the calculus is larger than 1 cm. in diameter it is rarely passed, and again operation is indicated. Acute pyelonephritis above the calculus removes it from the manipulative treatment group and the calculus must be removed to prevent further damage to the kidney. When the calculus occurs in cases of single kidney, or in which the other kidney is poorly functioning, it is in-

advisable to chance kidney damage by repeated ureteral catheterizations, and an open operation should be done.

Extraperitoneal uretero-lithotomy through a Gibson incision was done in 22 cases. In 17 the stone was in the lower ureter, and in 5 in the middle or upper ureter. The ureter was not sutured in any case. In one case two calculi were impacted in the lower half of the ureter. Although they were removed the opening in the ureter refused to close, a pyonephrosis ultimately developed, and a nephrectomy was necessary. There was one operative death and this occurred following an uretero-lithotomy in a hæmophiliac. A nephrectomy was necessary in 10 cases on account of kidney destruction. In 2 cases in which the kidney had been removed and calculi left in the ureteral stump, a pyo-ureter resulted and an ureterectomy was necessary.

In the 75 per cent of cases which do not come under the above conditions, cystoscopic manipulation is the treatment of choice. In this series the following types of cystoscopic treatment were used:—(1) simple ureteral catheterization; (2) dilatation by multiple catheters or a Garceau catheter; (3) ureteral meatotomy by scissors or fulguration; (4) ureteral anæsthesia; (5) injection of oil.

The mere passage of an ureteral catheter is often sufficient to dislodge the calculus and promote its downward passage. This occurred in 48 per cent of the cases. If this method is not sufficient the insertion of a large Garceau catheter, F. 9-12, or the insertion of multiple (2-3) ureteral catheters, is done. The multiple catheters, left in position after the cystoscope is removed, are twisted around several times and on withdrawal the calculus occasionally comes with them. The ureteral catheter or catheters are sometimes left *in situ* for twenty-four hours.

In 23 per cent of the cases it was noted that the ureteral orifice on the affected side was definitely stenosed. In these cases and in cases in which the calculus became stationary in the lower half inch of the ureter, an ureteral meatotomy was done. The superior wall of the ureteral orifice was incised by scissors or by fulguration, and no troublesome hæmorrhage was encountered as a result of this treatment.

The results obtained from the use of local ureteral anæsthesia, or from injection of oil above or around the calculus, failed to show convincing proof of their efficiency, and this form of treatment has not been used in the last one hundred cases of the series. None of the various mechanical dilators were used. Ureteral dilatation to as high a point as possible is the important part of the non-operative treatment.

TABLE I.

NUMBER OF CASES OF URETERAL CALCULI—200

	Number	*Percentage*
Treated by cystoscopic manipulation	162	81
Treated by open operation	34	17
Refused treatment	4	2

TABLE II.

CYSTOSCOPIC MANIPULATION—162 CASES

Calculus passed	*Number*	*Percentage*
After 1st dilatation	79	48+
After 2nd dilatation	36	22+
After 3rd dilatation	9	5+
After meatotomy	38	23+

TABLE III.

NUMBER OF OPERATIONS—34

Type	*Number*	*Percentage*
Uretero-lithotomy	22	64+
Nephrectomy	10	29+
Ureterectomy	2	5+

THE AFTER-TREATMENT

It would seem reasonable to suppose that retention in the kidney pelvis is one, if not the most, important cause of calculus formation and any attempt to prevent the recurrence of calculi must combat this retention factor. All lower urinary tract obstruction must be removed and any condition giving rise to retention in kidney or ureter must be treated. The routine advice given is that one or two ureteral dilatations should be done following the passage of the calculus, to remove, if possible, any ureteral obstruction that may be present. The general hygienic measures to be followed are graduated exercise, regulation of bowels, elimination of alcohol, and the use of a low protein diet. The urine must be kept dilute, and two or three quarts of water, preferably distilled, should be drunk daily. By relieving the obstructive factor and keeping the urine dilute the incidence of recurrence of calculi will be materially decreased.

THE SIGNIFICANCE OF INFECTION IN CARDIOVASCULAR DISEASE*

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THE study of cardiac affections after Laennec's discoveries was concerned principally with the mechanical and anatomical aspects; with MacKenzie, attention was brought back to the essential consideration of function in terms of myocardial efficiency. The great clinician of the Dublin School, William Stokes,[1] had written in 1854, "It will be seen that, while the diagnosis of valvular disease depends upon the existence and appreciation of certain physical signs, the questions of prognosis and treatment depend upon the condition of the muscular portions of the heart;" but it remained for Mackenzie to reinterpret this point of view in the light of modern physiology. Following Mackenzie's work, and stimulated in large measure by it, cardiological study may be said to have entered another period with the stressing of etiology and a realization of the importance of infection in cardiac disease. The search for an etiological basis has provided us with the first ordered classification of heart disease; it has carried medicine beyond the mischievous terms—a legacy of war-time—of V.D.H. and D.A.H.; it has given a foundation for prognosis and has directed the main line of attack upon the important problem of the prevention of heart disease. In a word, diagnosis from the etiological standpoint has served to clarify many of the problems in cardiovascular disease. The result has been an increasing accuracy in definition and nomenclature. This has been particularly true in regard to the term "functional". Lewis[2] and others have emphasized the fact that it does not follow that all cases of structural change in the heart are serious, or the converse, that all cases in which symptoms point to an affection of the heart but in which no evidence of structural disease is found (sometimes called "functional") are of trivial import. A proper understanding of the term "functional" with well defined etiological considerations in mind is of prime importance in the handling of cardiac affections.

THE BROADER ASPECTS OF INFECTION AND HEART DISEASE

"Infection is the chief cause of heart disease in the stage of its inception and in the stages of its advance". (Lewis[2]). This statement expresses in summary fashion the general relation between infection and cardiovascular disease. Certain specific infections have become recognized as etiological agents and are embodied in our classifications of heart disease—rheumatism, syphilis, bacterial endocarditis, diphtheria, septicopyæmia. It is the purpose of this paper to consider the relation of infection to heart disease along less definitely established channels and to review other problems associated with infection. For our present etiological classification by no means fully expresses these relations and it is at least possible that the solution of some problems in cardiac disease depends upon the recognition of factors associated with infection.

In the main, three aspects of the problem are implicit in this discussion.

1. The probability that a febrile illness which has been followed by an insufficient period of convalescence causes a permanent decrease in cardiac reserve, thus virtually initiating cardiac disease.

2. The responsibility of infection for the progression of the cardiac disability in hearts already damaged by rheumatism or arteriosclerosis.

3. The connection of infection with some of the unsolved problems in cardiovascular disease, such as the questions of the etiology of coronary occlusion and so-called chronic myocarditis.

THE PROBLEM OF INFECTION

The rôle of infection in the causation of heart disease and in initiating heart failure in hearts already damaged is a puzzling problem. The

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phenomena involved are extremely complicated. In the first place there are circulatory disabilities which pathologically cannot be correlated with structural changes. Then we are still ignorant of the way in which the myocardium reacts to noxious agents, experimental investigation having yielded information only about the cardiac involvement in diphtheria and subacute bacterial endocarditis. Moreover, it is difficult to determine how extensive or permanent an influence toxicity may exert upon the myocardium during the course of an infectious disease.

Infection may produce changes in the heart by the direct invasion of the cardiac tissues by the organism, or by the effect of toxins elaborated by organisms present in other parts of the body. Under these circumstances, the actual mechanism by which circulatory disturbances may develop is not certain. From a physiological point of view the difficulty may appear to depend upon failing vasomotor control of the arteries; the pathological point of view emphasizes degenerative changes in the myocardium as the essential factor. It is difficult to determine which mechanism operates. Allbutt has pointed out that there is no criterion by which we can distinguish between the effect of myocardial lesions and a failure of the peripheral circulation.

MYOCARDIAL FATIGUE

A common cardiac sequel to infectious disease or a debilitating illness is a condition in which the patient complains principally of fatigue, palpitation on exertion, vague precordial distress, and restlessness. On examination nothing is noted beyond a tachycardia. Christian[3] has applied the term "myocardial fatigue" to such a state and it has been characterized by Mackenzie[4] as "the poisoned heart". It would seem to be the peace-time counterpart of the condition described as the "irritable heart" of soldiers. The studies of cases of "irritable heart" during the war indicated that the principal symptom was a sense of exhaustion, that the onset of the difficulty was usually due to some infection, and that the individuals led strenuous lives while they were still suffering from the effects of the infection.

It becomes important, therefore, to emphasize this effect of toxæmia upon the circulatory system and to realize the necessity of longer convalescent periods than are at present allowed after an acute infection. This is true even of minor febrile affections, particularly in persons over the age of forty in whom degenerative processes may have begun. Every physician has had the experience of patients of this age period slowing up and exhibiting cardiac symptoms and a definite decrease in cardiac reserve following a febrile illness of a few days' duration, usually termed "influenza".

INFECTION AS THE IMMEDIATE CAUSE OF HEART FAILURE

It has been to a great extent the accepted idea that cardiac failure depends upon a myocardial abnormality associated with a lesion of myocardial tissue, interference with the coronary blood supply, or lesions of specialized conduction tissue, and that the precipitating cause of the failure is prolonged cardiac overwork. In the direction of cardiac patients the overload is the feature that has been stressed. In a consideration, however, of a series of cases of heart failure it is difficult to convince oneself that exertion has been the determining factor in precipitating the failure. As Burwell[5] and others have pointed out, neither the severity nor the duration of the overwork corresponds with the degree or with the time of the onset of failure. In a discussion of this problem many observers emphasize the fact that infection is a more common cause of heart failure than is generally recognized. Frequently, a cold, bronchitis, influenza, or broncho-pneumonia seems to be the precipitating cause of cardiac insufficiency.

In a discussion of the life history of the individual with hyperpiesia Hay[6] stresses the rôle of infectious illnesses. It is his experience that "the first serious depreciation in cardiac reserve and the earliest record of anginal pain are frequently closely related to a transient toxæmia." An example of the way in which a minor infection precipitates cardiac failure is found in the following case.

CASE 1

A female, aged 32, who had had rheumatic fever in childhood and the first myocardial "break" at the age of 24, but since that time had been able to do housework, developed a cold and went to bed the following day, when she became short of breath and began to cough. She was orthopnœic, cyanotic, and had a pasty

pallor. The pulse was 100 and regular; the heart enlarged, and the auscultatory findings those of aortic insufficiency. There were moist râles over both lung bases, but no œdema. For four days there was a fever to 101°. The myocardial insufficiency lasted for several weeks.

Whatever may be the fundamental nature of cardiac failure, it is evident that infectious illnesses act as a common precipitating factor. Moreover, in persons with chronic valvular heart disease recurring infections would seem to be chiefly responsible for the progression of the cardiac disability. For this reason it becomes important in the treatment of cardiac cases, as well as issuing the customary warning against undue exertion, to stress the necessity of guarding against infection even of a minor nature.

INFECTION AND CORONARY ARTERY DISEASE

Rheumatism and other infectious diseases have become recognized as important causes of vascular changes in the aorta and the coronary circulation in early middle age. Observers have also noted the relationship of previous infection to vascular degeneration and thrombosis. Clinically, the part played by infectious diseases in the development of angina pectoris has been demonstrated by many studies. Kahn,[7] in a discussion of the etiological factors in angina pectoris, emphasizes tonsillitis, rheumatism and influenza. Not only does infection sometimes initiate changes in the cardiovascular system which later lead to angina pectoris but such febrile illnesses may themselves precipitate anginal seizures. This is particularly true in the convalescence from influenzal infections. Hyman[8] has reported nine cases of angina pectoris in a group of 412 cases of acute influenza, representing a relative incidence of 2 per cent.

Turning to the closely allied condition of coronary occlusion, one fails to find in the extensive literature of this subject any critical analysis of the rôle of infection, either as a predisposing or as a directly exciting factor in the condition. It would seem, however, that coronary accidents occur more frequently in those who have had infections which attacked the blood vessels, such as typhoid fever, rheumatism and influenza. In several cases in the writer's experience coronary occlusion occurred in the immediate wake of respiratory tract infection. A brief summary of two such cases follows.

CASE 2

A male, aged 46, previously healthy, developed sore throat and an upper respiratory infection. At the time two others in the family were convalescing from a similar infection. Three days later he was obliged to go to bed and complained of some precordial distress. On the evening of the fourth day he suddenly developed very severe substernal pain and lost consciousness. He was found to be in shock; the pulse 18. Periodically, about every three minutes, typical Adams-Stokes seizures occurred. Electrocardiographic studies showed complete heart block, the ventricular rate being 26. The condition persisted for about 52 hours when death occurred. The clinical picture was that of coronary occlusion with complete heart block.

CASE 3

A male, aged 57, had an attack of influenza which lasted for four days. Recovery was rather slow, but he was able to go about his duties, though complaining of fatigue and a few twinges of sternal pain. Suddenly, while walking upstairs on the morning of the sixth day of convalescence, he was seized with substernal pain radiating to the epigastrium, and became unconscious. Examination showed signs of profound shock, with a rapid thready pulse, and death occurred in about three hours' time.

In both these cases the distinctive clinical picture of coronary occlusion followed a respiratory infection of moderate degree. This relation of infection and coronary artery disease is a question which would seem to be deserving of further investigation. Such studies would serve at least to clarify our knowledge of the pathogenesis of this grave malady.

RELATION TO CARDIAC ARRHYTHMIAS

Under certain circumstances an acute infection will initiate an abnormal cardiac rhythm. This occurs in persons who are already suffering from chronic heart disease, and unless the arrhythmia is associated with other signs of heart failure it is usually of short duration. It probably occurs most commonly in cases of coronary sclerosis in which the abnormal rhythm is the result of the action of the toxæmia upon the already damaged cardiac structures. The infection may be trivial and little more than an acute bronchitis. The arrhythmia is most frequently auricular fibrillation.

The following case is quoted in illustration.

CASE 4

A male, aged 60, with evidence of peripheral arteriosclerosis, had been under observation for years for minor complaints. The heart was not enlarged and the blood pressure averaged 120 systolic and 70 diastolic. There were never any complaints referable to the circulation. In the last six months he had had two attacks of acute sinusitis, three to ten days in duration. On both occasions paroxysmal attacks of auricular fibrillation were observed lasting from two to twenty-four hours. Between these attacks examination showed

nothing of note, and electrocardiographic studies have been normal.

INFLUENZAL INFECTIONS

Many observers have called attention to the cardiovascular changes which have followed acute influenzal infections. The occurrence of post-influenzal angina pectoris has already been commented upon. As pointed out by Hamburger and Priest,[9] the involvement of the heart following these acute infections has been both structural and functional. Structural involvement has been evidenced by the occurrence of heart-block, bundle-branch block, severe myocardial damage, and enlargement of the heart. Functional involvement has been responsible for the complaints of fatigue, palpitation, precordial pain and dyspnœa. In the influenza epidemics of recent years it was almost the universal clinical experience to find patients of middle age or over during their convalescence complaining of such symptoms, requiring months for a return of strength and not infrequently showing a permanent impairment of cardiac reserve. In the light of such experience one hesitates to separate too dogmatically structural and functional cases in dealing with conditions of this kind. In many of the cases in which no clinical evidence of structural damage was to be found, the electrocardiograph showed delayed auriculo-ventricular conduction, indicating serious myocardial injury.

The following case is an example of cardiovascular involvement following a mild acute upper respiratory infection (influenza).

CASE 5

A woman, aged 36, previously healthy, was ill for ten days with severe naso-pharyngitis and general malaise. Five weeks later she complained of weakness which had persisted since the illness. On examination, the cardiac rate was 90, the heart was not enlarged, and there was a definite gallop rhythm. Electrocardiographic studies showed a delayed P-R interval (0.28 second). After ten days of complete bed-rest the P-R interval returned to within normal limits.

THE RELATION OF INFECTION TO THE PROBLEM OF CHRONIC MYOCARDITIS

There is a type of cardiac disorder which constitutes one of the greatest problems in cardiology at the present time. It is a condition which still stands outside any of the accepted etiological categories of heart disease. There is no general agreement upon the terminology used to describe the disorder. The chief clinical features, however, are usually clearly defined. The patients as a rule are over 40 years of age. They complain of symptoms pointing to myocardial impairment—shortness of breath, palpitation and substernal distress. On examination, the most constant finding is cardiac hypertrophy. There are no murmurs indicative of valvular involvement; there is no increase in blood pressure, no arteriosclerosis, and no clinical or serological evidence of syphilis. The electrocardiogram rarely shows more than left ventricular preponderance. Such cases are apt to progress to myocardial failure of the congestive type. After death there is little to be made out beyond hypertrophy of the myocardium.

To this condition Christian[3] has applied the term "chronic nonvalvular disease of the heart" or chronic myocarditis. Hyman and Parsonnet[10] suggest the term "myocardosis." None of these terms is entirely satisfactory. During life many of these cases are diagnosed as coronary sclerosis and at post-mortem a certain number do show myocardial lesions associated with coronary artery changes, but there still remains the larger group in which there is no change in the coronary vessels, the valves or the pericardium.

The etiology of this type of myocardial disease is obscure. It has been suggested that the main cause is to be found in the degenerative processes of later life, but such an explanation fails to account for those cases which occur in earlier years. In many cases the condition appears to have followed an attack of influenza or pneumonia. Whether infection is responsible for the initial damage which later goes on to progressive reduction in cardiac reserve and cardiac hypertrophy it is impossible to say, but it seems possible that a relationship exists between the two. So far neither pathological nor clinical investigation has provided an answer to this problem.

SUMMARY

In the consideration of heart disease from the etiological standpoint infection plays the major part. The relation of certain specific infections such as rheumatism and syphilis to cardiac affections is well understood. The action of infection along less clearly defined channels and its effect on the heart are discussed.

REFERENCES
1. STOKES, Diseases of the Heart and Aorta, Lindsay and Blakiston, Philadelphia, 1854.
2. LEWIS, *Brit. M. J.*, 1919, **2:** 621.
3. CHRISTIAN, *J. Am. M. Ass.*, 1928, **91:** 549.
4. MACKENZIE, Principles of Diagnosis and Treatment in Heart Affections, Oxford University Press, London, 1916.
5. BURWELL, *J. Am. M. Ass.*, 1930, **95:** 1633.
6. HAY, *Brit. M. J.*, 1931, **2:** 43.
7. KAHN, *Am. J. M. Sc.*, 1926, **172:** 195.
8. HYMAN, *J. Am. M. Ass.*, 1930, **94:** 1125.
9. HAMBURGER AND PRIEST, *Am. J. M. Sc.*, 1923, **166:** 629.
10. HYMAN AND PARSONNET, *New Eng. J. M.*, 1931, **204:** 648.

DIPHTHERIA AND ACUTE TOXIC ENCEPHALITIS, WITH THE REPORT OF A CASE*

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MANIFESTING itself by a specific reaction, the pseudo-membrane, the subsequent clinical course of diphtheria depends on: (1) mechanical obstruction by the membrane; and (2) systemic poisoning from the toxins generated by the organism, affecting mainly the heart, kidneys, or the nervous system, while a severe congestion of the suprarenals is frequently found.

Considering the affinity of the toxin for the nervous system the paucity of literature on central nervous damage early in the disease is surprising, particularly in regard to acute encephalitis. Alfred Gordon,[1] and a few others mention diphtheria as an etiological factor in acute encephalitis, which would usually appear when the former was on the wane or in the convalescent stage. The lists of the Quarterly Cumulative Index Medicus, and of the Army Medical Library in Washington, D.C., contain no record of any case of acute encephalitis due to diphtheria, except one entitled "Post-diphtheritic encephalitis."[2]

This report cites the case of a 20-year old nurse who, one day after an initial complaint of sore throat, developed a typical diphtheritic membrane on the left tonsil, and was treated next day with 6,000 AE units of diphtheritic antitoxin (horse serum) which was repeated the following day. Four days after the appearance of the sore throat the patient was symptom-free, the membrane had disappeared, but the cultures were still positive. Next day, the patient became restless and anxious. Two days later, the pulse dropped below 50, and violent headache and nausea appeared. Anuria was present for 18 hours, and tremors were noted in the right hand. Neurological examination showed no disturbance, except a slight right facial weakness, an increase in tendon reflexes on the right, left patellar clonus, a right Babinski sign, on the left side, doubtful. Ophthalmoscope showed the left disk to be red and vaguely defined. Lumbar puncture gave a clear fluid at 25 mm. pressure, negative for globulin or organisms. This was followed by relief of headache and a mental clearing. The pulse returned to 80. Two weeks later neurological signs and symptoms were entirely gone.

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THE CLINICAL PICTURE

As a rule, 2 to 3 weeks after the onset of diphtheria, though at times as early as the 3rd or 4th day, nervous symptoms may appear. In fact, they may be one of the first things noticed in children and infants, in whom diphtheria is frequently a silent disease. Essentially, the nervous system changes consist of a parenchymatous degeneration of peripheral nerves, sensory and motor, resulting in paralytic phenomena which are stated by Samuel Woody to be pathognomonic of the disease. The paralysis may vary from a simple palatal weakness, or an involvement of any of the cranial or spinal nerves, to a multiple neuritis, in which conditions symptoms and signs may simulate hemiplegia, paraplegia, acute or chronic encephalitis, Bell's palsy, tabes, etc. In rare cases, the toxin must produce an immediate or delayed parenchymatous inflammation of the central nervous system itself, resulting in what clinically is defined as acute toxic encephalitis.

THE ETIOLOGY OF ACUTE TOXIC ENCEPHALITIS

Acute encephalitis cases will fall into any of four types:— (1) tuberculous; (2) encephalitis lethargica; (3) exudative encephalitis; and (4) non-purulent hæmorrhagic, or toxic encephalitis. The last may be due to poisons, trauma, toxæmia, or acute infections, which, in order of frequency, are measles, typhoid fever, influenza, and, more rarely, diphtheria, etc. Numbers of workers have tried to establish a direct connection between the specific organisms and the brain tissues in acute encephalitis. Pfhul and Nauwerk have found Pfeiffer's influenza bacillus in the brain, but though others surmise diphtheria and typhoid bacilli to be in the brain

in the cases of encephalitis, the organisms have not been demonstrated. Chartier[3] injected cultures in the carotid artery, and produced an encephalitis, but no organisms were detected in the brain or cerebrospinal fluid, and the conclusion reached was that, though the organisms may be in the vessels, it must be the toxins only that diffuse into the surrounding tissue. In fact, while *B. diphtheriæ* has been found in the blood, liver, and spleen at post-mortem it is rarely found in the blood during life, although Babinski[4] describes a septicæmic form of diphtheria which most likely was a streptococcal infection entering on a path already prepared under the pseudo-membrane. The close proximity of the diphtheritic site to the central nervous system, in the pharynx, nose, accessory sinuses, as shown by the Boston investigations, in the conjunctivæ, Eustachian tubes and middle ears, determines the absorption of the toxin into the great vessels, and their branches, which prepares the way for a diphtheritic neuritis or encephalitis or the rarer retrograde seeping of the toxin into the lymph channels up into the cranial cavity and its contents.

THE PATHOLOGY

Following the onset of the infection and the absorption of toxin, there appears an irritation of the cortex by congested vessels and minute hæmorrhages, and the portion of brain involved becomes swollen, red and softened, while a later exudation of serum into the cellular interspaces gradually produces pressure symptoms. Any part or all of the brain may become affected, the cerebrum more frequently than the cerebellum, so that the clinical manifestations of encephalitis will vary. If it is exclusively in the central portion of the brain, meningeal symptoms do not appear, and cerebrospinal fluid changes are absent. If it involves either the ventricles, or cortex, motor symptoms are manifest, and signs of meningitis may be noted, while the cerebrospinal fluid likewise is altered.

THE CLINICAL COURSE

Acute encephalitis may appear abruptly in previously healthy individuals, with indefinite symptoms of an acute illness, or during the convalescent stage of some fever. The symptoms may start acutely, with chill, fever, rapid pulse, then headache. Soon the patient becomes restless, starts to twitch, and may assume a curled-up position, or exhibit an opisthotonus resembling that of early meningitis or early anterior poliomyelitis. Projectile vomiting commences. Insomnia progresses to delirium, stupor, coma and death. The temperature will frequently reach an early high point of 106 to 107° or higher, and the pulse will drop to 40 or 50. Pupillary change is nearly always present. The pupils are frequently pin-point, and often react to light but not to accommodation. Ocular changes appear in many, indicative of a lesion of the grey matter of the mid-brain, diplopia, ptosis, or nystagmus. Signs of a mild meningitis, convulsions, tremors, diminished reflexes and paralyses are frequent.

One is struck with the manner in which acute encephalitis, epidemic meningitis, and anterior poliomyelitis resemble one another clinically, and the absolute necessity for early spinal puncture for diagnosis, before the terminal picture in an illness makes the diagnosis all too apparent, cannot be too strongly impressed. In one-third of the cases of acute toxic encephalitis the cerebrospinal fluid is normal, except for a slight increase in pressure. In one-half a lymphocytosis is present, the cell count usually being under 50, rarely 100 per c.mm. The globulin may be slightly increased. Various meningitides, including the epidemic type, have a turbid to purulent cerebrospinal fluid under pressure, in which the causative organisms are usually found, except in the cases of serous or aseptic (alcoholic) meningitis. In this type, the fluid is clear to opaque, with a negative culture, and a cell count of mononuclears running between 20 and 5000.

The cerebrospinal fluid of anterior poliomyelitis is clear, under varying moderate pressure, with a cell count between 10 and 300, shifting from polymorphonuclears early in the disease to mononuclears. Wherever there is doubt; where no organisms, exclusive of the globoid bodies of anterior poliomyelitis are found; where no immediately present or past history of some infectious illness, alcoholism, trauma or toxic factor is obtained; in the presence of clear fluid or low cell count, regardless of poliomyelitis or mononuclear cells, it is advisable to treat the case as one of anterior poliomyelitis.

The mortality in acute toxic encephalitis is high and varies with the causative disease,

rapidity of onset, the time interval subsequent to the primary disease, the height of the temperature, and, according to Rolleston, the previous treatment; and where recovery is effected, there is a tendency to tell-tale sequelæ, such as muscular weakness, mental changes, and certain signs suggestive of Parkinsonism.

TREATMENT

The treatment consists in the use of ice packs, cold colonic douches, magnesium sulphate by the mouth, heavy administrations of sedatives, spinal taps, intravenous hypertonic solutions, especially glucose, and treatment specific for the disease if the possible cause is known.

CASE REPORT

(Case No. 51951) A white female child, aged 18 months, entered the hospital at 8.47 p.m. with the history of convulsions and a high temperature.

Personal and family history.—Its parents were alive and well; no history of miscarriages. The birth had been normal and at full term. Feeding was also normal. There had previously been no convulsions. At 5 months the child sat erect; at 7 months its teeth started to appear; at 11½ months it walked, and was talking when a year old. It had had no vaccinations nor diseases, save otitis media at 9 months.

History of illness.—The illness had a sudden onset, starting with poor appetite. The bowels had been open, with four green semifluid stools, but there had been no colic, pain, or cries. On the evening previous to admission to hospital, the child vomited once after its usual dinner of fried eggs and some grape fruit. It usually slept well, but that evening was restless. Next morning, the morning of its admission, it was quite sleepy, and became more and more comatose towards evening. About 10.00 a.m. on the day of admission, the child developed convulsions, three in number, according to her mother. No expectoration was noted, but there had been and was frothing at the mouth. A physician was called. He found her temperature to be 109°, and had her sent immediately to hospital.

Physical examination.—The child was admitted to the hospital in a serious condition, vomiting, at 8.47 p.m. Temperature 105°; pulse 150; respirations 45. She was pale, well developed, lying quietly on her back in a comatose condition, motionless, except for twitching of the facial muscles, while there was a general rigidity of the body. She did not appear to be in pain, except for a short high-pitched cry when the muscles of the body would suddenly enter a convulsion, with an increase in the general flexion of all joints and an increased opisthotonus. There was a slight symmetrical wrinkling on brows and forehead. The eyelids were slightly but equally ptosed over staring winkless eyes, which showed internal strabismus, up and down nystagmus, eccentric, moderately dilated pupils, irregularly oval in outline, and reacting sluggishly to light. The face was symmetrical, with no risus sardonicus, though there was twitching, especially on the left side. The lips were cyanosed, while the jaws were tightly clenched in a continual trismus, defeating all efforts at an examination of the mouth and pharynx. Slight cervical adenopathy was noted. The chest was symmetrical. The breathing was slightly jerky and very rapid, the breath sounds, harsh, but otherwise negative. The thymus was not noted. The heart was not enlarged. Its sounds were regular, weak, and very rapid (150 per minute) with no murmurs. The abdomen was soft, rounded, with no rigidity. The extremities were well developed and equal; the fingers cyanosed; the left thigh showed purplish spots like post-mortem changes. A rigidity of the back muscles, decreasing in the neck, was noted, together with moderate opisthotonus. The arm muscles were moderately rigid in general flexion, the hands lying on the chest. The legs were rigid and extended. The convulsions were aggravated by handling, and were tetanic in nature, accompanied by a short highly pitched cry, part raising of the eyelids, and a universal flexion with opisthotonus, a twisting of the head usually to the left, and a momentary cessation of breathing with developing cyanosis. The Kernig sign was bilaterally positive. The Babinski reflex was negative on the left, positive on the right. The tendon reflexes, biceps, triceps, patellar and Achilles, were increased. Positive Oppenheim signs were bilaterally noted; the abdominal reflexes absent. A weak ankle-clonus was present, more marked on the right. The masseters were rigid, tense and equal. A spinal puncture showed a clear cerebrospinal fluid under slight pressure, slight globulin, with a cell count of 18, chiefly mononuclears. The tap gave moderate relief, the patient quietened down, with fewer convulsions. However, the child became progressively more cyanosed, the respirations more shallow, and more irregular; the pulse continued to mount, until, in spite of treatment, at 9.45 p.m. an hour after admission, the baby died with no signs of convulsions. The diagnosis was acute toxic encephalitis; cause unknown.

Autopsy was performed the following morning, approximately 12 hours after death. The major findings showed that the pleura, thymus, lungs, heart and great vessels were practically negative to gross appearance. The entire gastrointestinal tract was free from any abnormal condition. The kidneys were negative, but the suprarenals were soft and congested (probably post-mortem). The skull normal in thickness, and the fontanelles not closed. The dura was markedly adherent to the skull, especially over the left side. The brain was moist; the vessels markedly distended over the entire surface of the cerebral hemisphere. The cerebrum showed linear petechial hæmorrhages throughout the white matter. The cerebellum, pons, medulla and spinal cord appeared to be negative.

The throat and nasopharynx were filled with a yellow purulent secretion which obscured the tonsils. However, a dirty gray slough was apparent on the pharyngeal wall posterior to the tonsils. Cultures and smears were taken of the material on both tonsils and throat; and cultures were taken of the cerebrospinal fluid, and sections of the cerebrum and heart. The tonsillar and throat smears were loaded with *B. diphtheriæ*, and the cultures from them were positive for the same organism. The cerebrospinal cultures, and the sections were entirely negative for organisms.

Cause of death: acute toxic encephalitis due to diphtheria.

SUMMARY

A case of diphtheria is reported, manifesting itself clinically from the beginning of the disease as an acute toxic encephalitis. Having similar cerebrospinal findings, anterior poliomyelitis must here be differentiated by its major symptoms of nervousness, muscular weaknesses, and apparent low toxicity, in contradistinction to the restlessness, torpor, marked toxicity, and evident central nervous involvement of toxic encephalitis. Actual cultures of *B. diphtheriæ* were obtained and a pseudo-membrane was pres-

ent in the nasopharynx in this case of acute encephalitis. No evidence was found of invasion of the central nervous system, or cerebrospinal fluid by the diphtheria organism itself. A suprarenal congestion, that may be noted in diphtheritic toxæmia, was also found.

The conclusion is that the central nervous system may be affected by the diphtheria toxin early in the disease, or as a sequel.

REFERENCES

1. GORDON, Tice's Practice of Medicine, W. F. Prior, Hagerstown, Md., Vol. 4, 1st edit., 1931, p. 524
2. QUERIDO, *Nederland. Tijdschrift voor Geneeskunde*, 1928, **72**: 181.
3. CHARTIER, L'Encephalite aigue non suppurée, Thèse, 1907.
4. BABINSKI, Lehrbuch d. Kinderkrankheiten. (See also Hiss and Zinsser, Text Book of Bacteriology, Appleton, New York, 4th edit., 1920, p. 518).

FIFTEEN YEARS' EXPERIENCE WITH RADIUM*

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XVI

TO the late Dr. Aikins, of Toronto, undoubtedly belongs the credit of being the pioneer user of radium in Canada. Our interest in radium started while at Johns Hopkins Hospital, 1913-1914, through the influence of Dr. Howard Kelly and his associate, Dr. Burnam. Included in the cases treated during this period, we have 1,060 that have recorded treatments and follow-ups with sufficient data to form the basis for the summaries and deductions that follow.

The treatments have not been confined to radium alone. From the inception of our work, and with increasing frequency as our clinic developed, we have used combined methods of treatment whenever possible. We refer to the actual cautery, to fulguration, to electro-coagulation, and especially to deep therapy as applied by high voltage (140,000 to 200,000 volt x-ray). Surgical measures have been freely used whenever indicated, radium being regarded as the handmaiden of surgery, rather than the reverse. Our doses will be quoted in milligram-hours, as we believe the milligram is better understood than the millicurie.

The table following shows results and approximate total dosage in a few of the more common types of disease treated. This is submitted as a matter of interest, not as a guide to treatment, and for that reason no mention is made of any of the various techniques adopted.

This is the sixteenth in the series of articles on physio-therapy published in the *Canad. M. Ass. J.* The preceding papers will be found in 1931, **24**: 263, 409, 539, 679, 831; and **25**: 65, 164, 311, 444, 582, 702; 1932, **26**: 62, 195, 308 and 435.

BENIGN TYPES

1. *Skin diseases.*—Radium will be found useful in many localized types. For the generalized skin diseases the use of x-ray is much more practical. Nævi and birthmarks, especially of the port-wine type, are better treated by radium. The patient must be prepared to be treated at long intervals, for from one to two years, if the best results are to be obtained.

2. *Goitre.*—Only exophthalmic goitre can be successfully treated by radium. We have many cases of goitre of this type cured by radium. A few have recurred, and have been operated on later, usually after six or seven years. The pre-operative treatment by Lugol's solution has so simplified the handling of these cases that we think radium will be less used in the future. While we believe radium gives wonderful results in many of these cases, we believe that operation in the same patients will give 10 to 20 per cent better results. These factors, and the added time consumed, are the principal objections to radiation.

3. *Uterine hæmorrhage.*—Probably the most satisfactory treatments given are those for non-malignant uterine hæmorrhage. These patients comprise a large class, including patients at both ends of the menstrual cycle. The adolescents, a small class, we will in future treat by small multiple doses. The larger class, the cases of fibrosis occurring about the time of the menopause, give 100 per cent of good results. All these patients are given a diagnostic curettage and radium is inserted at once. Once in thirty cases, we pick up an unsuspected carcinoma of

TABLE I.

Classification	*Limits of Dosage, Mgrm. hrs.*	*Average Dose*	*Percentage of Success*	*Remarks*
Pre-cancerous spots	50 — 150	100	100	On a thin scale one cauterizing dose, unscreened.
Rodent ulcer	100 — 3,500	400	90	Frequently combined with fulguration and deep therapy.
Rodent ulcer of eyelid and nose	125 — 5,000	300	95	
Rodent ulcer of ear	400 — 700	500	80	
Carcinoma of the cornea	250 —	250	100	Three cases only. One patient had greatly improved vision, due to effect on cataract.
Carcinoma of the larynx	600 — 1,200	1,000	66	Three cases; all treated by laryngeal section, and by fulguration also. The two cured cases had necrosis of cartilage.
Lupus	60 milligram-hours per square centimetre of involved surface			
Graves' disease	1,800 — 4,000	3,000	See notes	
Carcinoma of the lip	100 — 1,200	325	88	Combination methods used; deep therapy over the glands in every case.
Carcinoma of the penis	2,000	2,000	50	Two cases—one cure and one failure.
Carcinoma of the bladder	600 — 1,600	1,200	40	All treated by open operation.
Uterine flowing	600 — 3,200	1,500	98	Comprises non-malignant cases of all varieties, especially fibrosis.
Adolescent hæmorrhages	200 — 800	600	100	Only used after unsuccessful medication and curettage.
Uterine fibroids	1,200 — 2,400	1,800	95	Cases carefully selected.
Carcinoma of the cervix	1,200 — 7,000	3,850	See notes	

the fundus in this manner. These cases are subsequently operated upon.

4. *Fibroids.*—In the *Canadian Medical Association Journal* (1920, **10**: 652) we published the results of treatment of one hundred cases. We can repeat, with very few changes, the summaries then presented, as representing current opinion to-day.

(a) Unsuitable cases: Tumours extending above the umbilicus; inflammatory lesions of any other abdominal organ as a complication; any suspicion of malignancy; tumours causing severe pressure symptoms; degeneration indicated by rapid growth, necrosis, cystic collections, calcification.

(b) Suitable cases: Fibroids up to the size of a three months' pregnancy; fibroids not producing pressure symptoms; fibroids in which hæmorrhage is the chief symptom; fibroids of any size, in bad surgical risks, when hæmorrhage and not pressure is their chief symptom.

(c) The advantages of radium treatment: The safety—no deaths are reported by any worker; no loss of patient's time in treatment or in convalescence; the expense is about one-half the total cost of operation; patients are in better general health than after operation; radium can be used where operative mortality would be high, as in chronic nephritis, diabetes, severe anæmias, heart lesions, and tuberculosis.

MALIGNANT TYPES

In general, in malignancy, clearing up local infections before treatment is important. The total dosage should be given as rapidly as possible without breaking down the patient's resistance. Sharp differentiation must be drawn between the calculated dose given at the applicator, and the real dose which will reach and must cure the remote point in a tumour below the surface. For example, only about 10 per cent of the skin dose will reach the far side of a tumour four inches thick. Treatment of accompanying anæmia and maintenance of the correct blood level for a year or more after treatment is necessary.

1. *Rodent ulcer.*—Patients with the ordinary rodent ulcer, with no invasion of bone or cartilage, are easily cured by any radiation method, with sufficient dosage. Patients who have been previously insufficiently treated by radium, by caustics or any other measure, require much larger doses, the dose averaging 1,200 milligram-hours. If a definite ulcer larger than a 25 cent piece be present, a large well-screened dose should be given at the first treatment, the radium being arranged so that it lies around the periphery of the ulcer. Involvement of bone or cartilage implies the use of still larger doses with thicker screening and at times distance dosage.

Rodent ulcers of the eyelid, the ear, and the nose frequently have involvement of the cartilage. A cauterizing dose should be avoided, as it will cause necrosis of the cartilage. This is as difficult to deal with as the primary ulcer. One or two well-screened doses given at a distance, followed in a few cases by a light cauterizing dose, will solve the problem.

2. *Carcinoma of the lip.*—As seen in the office, 80 per cent have no palpable involvement of the glands. Radium is applied to the primary growth on the lip only. The cervical glands are treated by deep therapy in every case, irrespective of the apparent severity. Radium is only otherwise used where the glands are evidently diseased. Such cases are operated on and radium used in the wound depths. Our failures have been in the cases with glandular involvement evident on the first examination.

3. *Buccal and lingual cancers.*—In contradistinction to the success in lip cases has been the comparative lack of success in the majority of buccal, tongue and tonsil cases. Here 80 per cent have very early glandular involvement. We feel that none of these cases can be treated by applicators, but require large doses by inserted needles. In our successful cases, we have had trouble with necrosis, and slow painful healing. Our experience has taught us to use every other possible aid, especially electro-coagulation and deep therapy, using radium as an adjunct.

4. *Cancer of the uterine cervix.*—All types treated are treated by radium and deep therapy. No cases with marked cachexia are treated. We have learned by sad experience, some years ago, that a large dose of radium in a cachectic, septic patient will cause death quickly. In the squamous-celled type, constituting 95 per cent, we use radiation only. In the other 5 per cent, the adeno-carcinomata, we also operate.

Our idea of results depends on the classification of types. In the figures following we have eliminated all the cases in which only palliative treatment has been given. These are the cases treated at the low limit of 1200 milligram-hours, with resulting temporary lessening or disappearance of the local growth, lessened pain, discharge and odour. In the types that we feel stand a gambling chance for cure, our doses run from 4000 to 7000 milligram-hours. In these more favourable cases, our one year successful results will be 75 per cent; two year 50 per cent; three year 40 per cent; five year 25 per cent; dropping to 10 per cent after ten years. Our oldest living cases at present are one each treated in 1918 and 1919. Success lies in an accurate diagnosis of the extent of the lesion, in the amount of ingenuity or mechanical genius one can display in placing the radium needles, and in directing the cross-fire of deep therapy radiation.

In all malignant growths, before the first treatment, one should map out the dose of radium and the other measures to be employed. This should be based on the size, the location and the estimated malignancy. As far as radium and radiation are concerned, no change should be made in this pre-conceived program, as otherwise one will be disposed to cut down the essential dosage because of an apparent recovery.

TYPES OF DISEASES TREATED DURING A FIVE YEAR PERIOD AT THE BRANDON MENTAL HOSPITAL*

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IN the brief time at our disposal we shall endeavour to present a bird's-eye picture of the kinetic and static population of our hospital during the five year period, 1925 to 1929, inclusive.

The daily number of patients in residence was 1,072; approximately 100 in the Receiving Hospital, 100 in the Colony Building, and the remainder in the main building. During this period 1,088 patients were admitted, and of these, 237 were readmissions. The new admissions were classified as follows:

TABLE I.

Organic psychosis	209
Psychogenic psychosis	547
Undiagnosed psychosis	29
Undiagnosed	7
Without psychosis	59
	851

During this period the disposal of the cases was as follows:

TABLE II.

EXTERNAL:	
Transferred	12
Eloped	22
Deported	43
Died	258
Discharged	478
INTERNAL	275
Total	1,088

It will be seen, therefore, that there has been an increase of 275 patients over the five year period, the majority of these patients being of the dementia præcox type that at present are cared for in the main building.

We shall, for the purpose of analysis, divide our cases into two main groups: the *organic*, composed of 24 per cent of new admissions, and the *psychogenic*, comprising 76 per cent.

Organic psychoses are those which involve actual destruction of the nervous structure in the brain, with varying degrees of mental deterioration as a result. In this group we include the senile, arteriosclerotic, and alcoholic.

(*a*) *Senile Psychosis.*—This group constitutes 11.6 per cent of all admissions. It is essentially

*As read before the Annual Convention of the Manitoba Medical Association, Brandon, September 10, 1931.

TABLE III.

1. ORGANIC PSYCHOSES (24 per cent)

	851 New Admissions		*478 Discharges*		*58 Deaths*	
		Per cent		Per cent		Per cent
Traumatic	1	0.11	0		1	0.4
Senile	99	11.6	19	3.4	63	20
Arteriosclerotic	37	4.3	13	2.5	22	8
Syphilis	22	2.6	2	0.4	22	8
Huntington's chorea	1	0.11	0		0	
Brain tumour	3	0.3	1	0.2	4	1.6
Organic brain disease	13	1.5	0		1	0.4
Alcoholic	19	2.2	19	3.5	1	0.4
Drugs—lead, etc.	3	0.3	0		0	
With somatic disease	11	1.2	9	1.5	5	1.9

exaggeration of the characteristics of old age, often summed up in the common phrase, "childishness". It is characterized by failure of memory, especially for recent events, with a general reduction of mental capacity. Deterioration takes place, and the patient becomes unable to dress and feed himself, and is untidy in his habits. The death rate is high, 20 per cent; the discharge rate, nil. These patients require care in a mental hospital, and are quite contented and happy. They are bathed daily, fed carefully, and receive bed care in the hospital section proper. The staff invariably address the old men as "Dad", so that a happy home-like atmosphere surrounds these old people in the twilight of their life. Owing to their confusions, general debility, and unsteadiness on their feet, they are liable to sustain fractures, especially of the neck of the femur, but, as a rule, they respond well to treatment.

(*b*) *Cerebral Arteriosclerosis.*—This psychosis is closely allied to the preceding group and comprises 4.3 per cent of admissions. The cardinal symptoms are due in part to the diminution of blood supply to the brain, in part, to the latent psychotic tendencies of the individual. Memory is impaired for all events, and there is general mental impoverishment. The patient is emotionally unstable, weeping and laughing without cause, and rapid transition of mood takes place. Irritability is often marked. The onset may be insidious, characterized by focal signs, such as headache or dizziness; or may be abrupt, ushered

in by an apoplectic stroke. It has been said that if the patient recovers from the stroke, the condition is one of thrombosis, if he dies, it is one of cerebral hæmorrhage. This may not be always the case, but it is a good average of cases seen. Routine treatment of a stroke is simple but essential—absolute rest with the head of the bed raised, saline by mouth, if necessary by means of a tube, enemas, catheterization, and water. An ice-cap should be applied to the head. After absolute rest in bed for seven days, the initial paresis often shows rapid improvement. Our experience with drugs in this condition has been unfortunate, even with small doses.

(*c*) *Syphilis.*—The spirochæta pallida is responsible for 2.6 per cent of admissions, the majority of these being general paresis. Here the spinal puncture is the outstanding diagnostic measure, a positive Wassermann test being present in 90 per cent of cases. The colloidal gold and mastic curves are pathognomonic, unless modified by previous treatment. The mental changes are those of deterioration, combined with certain physical signs, such as tremor and difficulty in speaking. Marked improvement in these cases has taken place under the combined treatment with malaria and neosalvarsan, mercury, or bismuth.

(*d*) *Brain Tumour* comprises 0.3 per cent of admissions. Here we find that mental changes often precede the so-called "cardinal" symptoms of headache, vomiting, and choked disc. The prognosis is bad.

(*e*) *Alcoholism.*—During the period 19 cases were admitted, and 19 cases discharged. No cases of delirium tremens were admitted. The acute cases seen in this hospital have been of the hallucinatory type, with delusions of persecution. Treatment is directed towards elimination and increasing the patient's resistance, both physical and mental. The prognosis is good for the actual attack, but recurrence is frequent.

The chronic alcoholic shows the paranoid trend, with a tendency to fabrication. These cases may improve and the patient be discharged, but recurrence is frequent, due to the inadequate type of personality of such individuals.

Psychogenic psychoses compose the second group of cases and include about 80 per cent of the cases treated in mental hospitals. These cases are placed in this group because we do not find definite pathological lesions at post-mortem. It is said that psychogenic psychosis must naturally have an anatomical substratum, but this is incorrect. The substratum consists of a predisposition of the individual to certain types of mental disorder. The classification is shown in Table IV.

TABLE IV.

2. PSYCHOGENIC PSYCHOSIS

	851 Admissions		*478 Discharges*		*258 Deaths*	
		Per cent		Per cent		Per cent
Manic-depressive	107	12.5	121	25	19	7
Involutional melancholia	34	3.9	29	6	6	2.3
Dementia præcox	289	32.7	112	23	80	30
Paranoid conditions	23	2.7	16	3.3	9	4
Epileptic psychosis	22	2.5	12	2.5	9	4
Psychoneurosis	17	2	24	5	0	0
With psychopath. pers.	12	1.4	16	3.3	0	0
With mental deficiency	43	5	15	3.2	3	1.1

(*a*) *Manic Depressive Psychosis.*—New admissions, 12.5 per cent.

The name is descriptive of the phases of the psychosis, that is, a manic reaction or a depression, or a mixture of the two. It is essentially a mood disorder, that is, the emotions are not under control. The manic reaction is characterized by a feeling of well-being, over-talkativeness, over-activity, in severe cases, accompanied by violence. The more acute the onset, the better the prognosis. The patient may recover from this phase or pass into a depressive reaction, with a feeling of insufficiency, both mentally and physically, with depression and retardation. During the phase of increased activity hydrotherapy is preferred to drugs as a sedative measure. Restraint in this hospital is little used and one looks forward to the time when such treatment will be regarded as obsolete. During the phase of depression one must be on the alert for suicide, remembering that the victim of every depression must be regarded as a potential suicide. Even admitting this last statement, one finds it necessary to allow considerable liberty to patients with depression, with a view to awaken their interests and so aid their recovery. This has been done with dramatic results.

(*b*) *Involutional Melancholia.*—Admissions, 3.9 per cent. This is a depression coming on at the period of involution, roughly 45 years. The outstanding features are depression with marked agitation, and feelings of unforgiveable sin committed are common. The prognosis of these cases is good, judging from our records here, in which 34 patients were admitted and 29 were

discharged, but the period of recovery is prolonged often up to three years.

(*c*) *Dementia Præcox.*—Admissions, 32.7 per cent. This is the largest group we have to deal with, and, as the prognosis is bad and the patient young, it is this group which swells the total institutional population. Dementia præcox is essentially a personality defect or a character change which becomes apparent when the patient's life is studied over a period of three or four years. It is common in the introvert, that is, the seclusive sensitive individual, who finds that his mental and physical capacity is insufficient to bring about the realization of his dreams and ambitions.

The paranoid type is characterized by delusions of persecution and grandeur, with auditory hallucinations, with slow mental deterioration. The sufferers are alert individuals, often of previous brilliant intellectual capacity. As they are evasive, suspicious, and antagonistic, it is difficult to gain their confidence or to do anything for them. The prognosis is bad.

The catatonic type may show a behaviour superficially resembling the manic excitement. This patient is negativistic, resistive, and impulsive. He may show stupor, which is accompanied by marked inactivity, rigidity of muscles, and resistiveness. Often the patient in such a stupor is conscious of all that goes on about him, and will discuss later the events which have happened during the stage of stupor. These patients frequently have to be tube-fed and cared for, as they show a marked tendency to retain both urine and fæces. They are difficult to treat, but the prognosis is the best of any of the præcox group.

The hebephrenic shows silly behaviour with grimacing and mannerisms of speech and actions. The simple type, characterized by marked loss of interest, goes to make up the "hobo" class and the misfits of the community.

As the dementia præcox groups form a large percentage of the static population of our hospital, we may digress here and mention the care of the unrecovered case in this institution. They are generally labelled as chronic patients, and, unfortunately, the treatment is too often chronic. One must aim at re-educating the individual to accept hospital routine and make himself a useful member of the hospital community. Every effort is made to get him in good health. If he has a physical defect, such as hernia, this demands an operation, because such patients if physically unfit are unable to work, and so deteriorate rapidly, both physically and mentally. The patient is then urged to take part in some regular occupation such as gardening, farming, laundry work, printing, or formal occupational work. If possible, he is given a definite responsibility, and it is remarkable the pride he takes in doing some definite piece of work and being responsible for the same. Outdoor work is preferred, and out of 600 male patients in this hospital we have 200 actively engaged in productive farming. The patient's interest in life is aroused by work and recreation. A picture show takes place weekly, a religious service weekly, dances twice monthly, and, in addition, concerts and musical shows are provided. This year, organized sport, in the form of a football and softball league, was carried out with marked success. Library books have been placed on the wards so that a patient can get a book at any time he cares to read.

Pride in the patient's personal appearance is inculcated by having him shaved and properly dressed for each social function he attends, and this goes a long way towards maintaining his self-respect. A wider extension of individual and group parole is being made, with beneficial effect. The introduction of the open ward where the patient may come and go freely, while increasing the work of supervision, at the same time is a rational method of progress. Even deteriorated patients are taken on walking parties and given a modified form of Swedish drill. There is no doubt that in caring for the health and happiness of this type of patient, one is doing something which pays large dividends on small investments.

The care of patients physically ill is carried out in the hospital section proper. A large variety of diseases is met with, such as erysipelas, tuberculosis, acute rheumatic fever, diabetes, and acute respiratory affections. The surgical conditions include herniotomy, prostatectomies, and an unusual type of paralytic intestinal obstruction, which responds much better to stimulation than to surgical procedures. Two thousand cases were treated in the hospital sections of the main building during the five year period.

(*d*) *Paranoia.*—Admissions, 2.7 per cent. The condition in this group is characterized by an insidious development, and the persons affected are spoken of as eccentric. They develop delusions of persecution which become systematized. The intellectual capacity is not impaired. In

the period under discussion, 23 patients were admitted and none were discharged, the prognosis being extremely grave.

(*e*) *Epileptic Psychosis.*—Admissions, 2.5 per cent. The epileptic patient is difficult to treat on account of the unfortunate personality seen in these cases and the accidents caused as a result of seizures. Luminal and bromides may for a time control the seizures, but are said to produce more rapid deterioration. The ketogenic diet at the present time is being tried out at this hospital. This diet is characterized by a high fat content. Here we may mention the condition of "status epilepticus" which arises with dramatic suddenness. The last case under observation had 132 seizures in 18 hours, followed by recovery. No treatment is of any use which does not control the seizures before the patient becomes exhausted, dehydrated and toxic. One hundred grains of bromide given by the mouth, if necessary by a tube, are often needed. Ether anæsthesia was used in the above case with beneficial results. Nembutal, 4 grains, given slowly intravenously, used in two cases, produces a striking result, as the patient is asleep before the needle is withdrawn.

(*f*) *Psychoneurosis.*—Admissions, 2 per cent. This group is important, especially to men in general practice, because the patients consult the family physician much earlier than the psychiatrist. Remember these patients are ill, and it is of no avail to pooh-pooh their troubles. The apparently unrelated symptoms detailed by the patient are an expression of emotional difficulties and instinctive disorders. Psychoanalysis, with a view to understanding the patient and giving him a clearer understanding of his difficulties, is the effective method of treatment.

TABLE V.

Undiagnosed psychosis	29
Undiagnosed	7
Without psychosis	59

TABLE VI.

3. WITHOUT PSYCHOSIS

	851 Admissions	*478 Discharges*		*258 Deaths*	
			Per cent		Per cent
Without psychosis		14	3		
Psychopathic personality	4	3	0.16		
Mental deficiency	30	4	0.8	4	1.6
Alcoholism	4	4	0.8		
Epilepsy	5	3	0.6		
Drug addiction	10	11	2	3	1.1
Past traumatic confusion	1	1	0.2		
Huntington's chorea	1				
Neurasthenia		1	0.2		
Mild psychasthenia	1				
Unclassified	2				

For the sake of completeness we present Table V. which includes cases not placed in the organic and psychogenic group.

We shall now deal with the disposal of cases in more detail. During the five year period there have been 258 deaths, a mortality rate of 4 per cent.

The discharge of patients is shown in Tables VIII. and IX.

TABLE VIII.

	Per cent
Organic psychosis	15
Psychogenic	75
Others	10

TABLE IX.

		Per cent
Recovered	165	35
Improved	239	49
Unimproved	74	17

In conclusion, we shall consider the factors governing the discharge of the patient from the protected environment to the unprotected stress and strife of everyday life. The recovered patient is one fit to "carry on" on his own responsibility; the improved patient is one who may need a protected environment, both economic and social. Careful diagnosis and rational treatment may, to a large extent, be nullified if the patient is set adrift on the ocean of life to sink or swim, as the case may be.

We make a careful study of the patient's abilities and adaptabilities. What work can he do? What sort of home environment is needed to prevent recurrence? It is here we feel the need of a well organized social service department. A knowledge of home conditions and the social and economic status of the patient's family would enable us to discharge patients with much more assurance than we now possess, and it would increase the number of patients discharged. The personnel of such a service must, of necessity, consist of specially trained workers with a full knowledge of mental hygiene. Such a service would render invaluable assistance to the local physician and to the hospital authorities, by supplying them with accurate information. Such workers could also supervise a discharged patient in a sympathetic manner, encourage him, and secure him employment. Mental cases would come in for treatment much earlier in the course of disease, with as a result a more favourable prognosis. The Public Health Nurses of the province are now being given a special training in

Mental Hygiene at the Winnipeg Psychopathic Hospital. These nurses will be of great value to the Mental Diseases Division in securing social histories and acting as agents between the hospital and the home, especially in the interests of patients in the more remote portions of the province.

We wish to acknowledge our indebtedness to Dr. T. A. Pincock, Medical Superintendent of the Brandon Hospital for Mental Diseases, for permission to use the records of the hospital in the preparation of this paper.

AVERTIN ETHYLENE ANÆSTHESIA*

BY WILLIAM B. NEFF, B.Sc., M.D.

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AFTER extensive use abroad, especially in Germany and various parts of the British Empire, avertin or tribromethanal, given rectally to produce complete general anæsthesia, has lately been gaining favour on this continent. In spite of the many advantages which the drug undoubtedly possesses, and in spite of the abundant proof that the lethal and anæsthetic doses are separated by a large margin of safety,[1] many surgeons are slow to recognize that this form of anæsthesia is without greater dangers than the inhalation anæsthetics in common use at the present time. Those who object point to the feature of controllability of inhalation anæsthetics as contrasted, in a general way, with the uncontrollability of rectal or intravenous anæsthetics. This fact was early recognized and a definite research movement has made considerable progress in establishing means of counteracting the untoward effects of avertin. From the pharmacology of the drug we learn that it is a respiratory depressant, slowing the rate of and causing shallow breathing. To offset this to a certain extent, amylene hydrate, a respiratory stimulant, is added. Avertin lowers the blood pressure, usually very slightly, 10-20 millimetres at the most, and ephedrine has been used to counteract this feature of vasomotor depression.[2] In the optimum dosage avertin is absorbed by the blood stream, and after a preliminary rise, which reaches a peak in half an hour, circulates at a concentration of approximately 1 mg. per cent, is detoxicated in the liver by glycuronic acid, derived from glycogen; and excreted by the kidneys. For the detoxication the glycogenic function of the liver must be good. Tolerance of the drug by the body varies directly with the metabolic rate. Thus hyperthyroid cases will stand 200 mg. doses well, while hypothyroid subjects may be deeply anæsthetized with one half the amount, given on the basis of milligrams of drug per kilogram body weight. Thyroxin, if given 20 to 30 hours prior to the avertin, is reported to be of value in lessening the initial rise of avertin concentration in the blood stream.[3] Due to the long period before anæsthesia that the thyroxin must be given its clinical value is questionable.

Schuberth[4] collected 72 cases from the literature in which death was ascribed to avertin. He concludes that in 18 of these cases the data were insufficient for judgment regarding the cause of death; in 23 cases there was no reason to consider avertin as responsible; in 17 cases it may have been responsible; in 3 cases it was probably responsible; and in 11 cases it was certainly the cause of the fatalities. In all cases avertin was given alone for complete surgical anæsthesia and in larger doses than 100 mg. per kilogram.

In view of these facts, an attempt has been made in this clinic to combine the good features of avertin with those of ethylene, so as to produce a synergistic effect. A quiet, smooth and controllable period of anæsthesia resulted. The following method has been used in 50 cases at the Homœopathic Hospital with uniformly good results.

The patient is seen some hours before the operation by the anæsthetist, and, if considered a suitable subject for avertin-ethylene anæsthesia, is weighed. Orange juice or malted milk may be taken freely the night before the operation, if not contraindicated by the surgical condition present, in order to increase the glycogenic reserve of the body. One hour before operation morphine, grain 1/6 or ¼, with atropine 1/150 or 1/200, is given hypodermically. A mixture containing 80 mg. of avertin per kilogram body weight in 2½ per cent aqueous solution is prepared and tested with Congo-red indicator for decomposition. This simple test is made by

* From the Department of Anæsthesia, Homœopathic Hospital of Montreal.

adding a few drops of Congo-red to several cubic centimetres of the avertin preparation in a test tube, just before using. A blue colour indicates decomposition into free hydrobromic acid and the corresponding aldehyde. The mixture is discarded, as hydrobromic acid can cause a severe proctitis and colitis. In some cases 30 c.c. of 20 per cent magnesium sulphate solution is added to the mixture, on the theory that the presence of magnesium ions seems to lessen the excitability of nerve cells, with apparently good results. The solution prepared is taken to the patient's room where the induction of anæsthesia is to take place. The room is darkened, all noise eliminated and, in general, everything is made conducive to natural sleep. Following this, the mixture is injected slowly into the patient's rectum and he is allowed to lie undisturbed, but under supervision, for fifteen or twenty minutes. Most subjects will be well asleep at the end of this period. Transfer to the operating table is now carried out. At this stage there may be some movements of the extremities or incoherent talking which are not remembered following the operation. Ethylene and oxygen are now given by the metric method, starting with about 3.5 litres of ethylene and 1.5 litres of oxygen per minute, and increasing the concentration of ethylene to suit the needs of the particular case. Carbon dioxide is given to overcome the respiratory depression of the avertin, and the amount required depends upon the observation of the anæsthetist; usually one-half litre per minute, for several minutes, is sufficient to stimulate respirations enough to provide good ventilation.

Except in the more prolonged operations excellent relaxation is obtained by avertin-ethylene without the addition of ether to the gaseous mixture. In abdominal operations which last over one hour and a half a small amount of ether will usually be necessary to supplement the ethylene while closing the peritoneum. In cases where difficulty with breathing is experienced, or anticipated, the introduction of an endotracheal tube will accomplish much.

SPECIAL TECHNIQUE FOR WORK ABOUT THE HEAD

In ear, nose and throat surgery the technique is somewhat different, in that an intratracheal tube is introduced and ethylene, oxygen, and carbon dioxide anæsthesia, without ether, is carried on. Although the tube may in some cases be inserted immediately after the avertin induction, in most instances this will result in some struggling, and it is much better to give the ethylene by mask for a few minutes before the introduction of the tube. In cases which are going to require extensive surgical procedures, if the largest tube which will fit the larynx is selected and a soda-lime container interposed between it and the bag, rebreathing can be taken advantage of, supplying just enough fresh gases to meet the metabolic requirements. This reduces the cost of this form of anæsthesia.

CONTRAINDICATIONS

Avertin is excreted by the kidneys, probably in the form of urobromic acid or an organic form of bromine. A severe nephritis would contraindicate its use. While repeated doses over a long period of time have produced no liver lesion, for detoxication of the drug the glycogenic function of the liver must be good. Low glycogenic function, such as occurs in severe liver disease, cachectic states and chronic septic conditions, would also be a contraindication. Avertin should never be given in the presence of colitis or proctitis.

ADVANTAGES OF AVERTIN-ETHYLENE ANÆSTHESIA

From the patient's standpoint one of the great advantages is in the method whereby narcosis is produced. All the unpleasant experiences associated with a trip to the operating room are avoided. Sleep comes naturally and peacefully; there is no physical or, what is worse, mental struggle. The great fear which so many patients harbour, the fear of the anæsthetic, is abolished. Post-operative nausea and vomiting is either done away with or is very slight. From the surgeon's standpoint the uniformly low dosage of avertin eliminates the element of chance and allows a positive control of the degree of anæsthesia in all cases. The muscular relaxation of avertin is further enhanced by a similar action on the part of ethylene; vomiting during operation is unknown. The colour can be kept much better than if nitrous oxide is substituted. To produce the same degree of muscular relaxation with avertin-nitrous oxide, using the same dose of avertin, a richer ether mixture will be necessary. It seems that, other conditions being equal, the degree of post-operative nausea and vomiting is directly proportional to the amount of ether added to the gaseous mixture. Of course this does not hold true if some mechanical factor is present, such as persistent peritoneal

irritation from peritonitis or from traction on the mesentery in acute dilatation of the stomach, etc. Morphia, post-operatively, can be given sparingly, due to the long persistent analgesia.

Patients who have had other general anæsthetics for previous operations uniformly agreed that the avertin-ethylene experience was the most pleasant, with one exception. This patient had previously had intravenous sodium amytal, and it was her opinion that she would prefer that anæsthetic should the need ever arise again.

BIBLIOGRAPHY

1. WATERS AND MUEHLBERGER, *Arch. Surg.*, 1930, **21**: 892.
2. GURD AND BOURNE, *Canad. M. Ass. J.*, 1931, **25**: 587.
3. NELL AND SEBENING, *Zentralbl. f. Chir.*, 1931, 1569.
4. SCHUBERTH, *Acta Scand.*, 1931, **68**: 55.

Case Reports

POPLITEAL EMBOLISM AND GANGRENE OF THE LEG COMPLICATING FIBROMYOMA OF THE UTERUS, PRIOR TO OPERATION*

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Mrs. C., aged 47 years, was seen at the request of Dr. R. J. MacMillan, of Toronto, on the evening of January 18, 1916. In the previous few years she had gradually increasing menorrhagia and recent bleeding was very free, with very short intervals.

Examination revealed the commonest cause of such symptoms. She had a large fibromyoma of the uterus extending from the pelvis to a little below the umbilicus. As she was bleeding freely at the time immediate removal to hospital was advised. She was told that removal of the uterus would have to be performed as soon as it could be satisfactorily arranged. Though not stated, it was considered that it might be undertaken the following day.

Being impressed by the free bleeding and the rather soft consistency of the uterus further enquiry was made as to pain, because of the possibility of active degeneration of the tumour. There had been no abdominal pain, but she stated that during the afternoon of that day she had some pain in the calf of her right leg. This had come on suddenly and was very severe, but was not of long duration. Examination of the leg and foot gave no indication of trouble, but the story gave a real warning. She was then told that, although she must go to hospital at once, some delay would be necessary so as to get her in fit condition for operation. That same evening she was admitted to the Wellesley Hospital.

Examination next day showed slight diminution of sensation in the toes of the right foot and a suggestion of reduction in their superficial temperature. On the next day these symptoms were more marked, and it was then fairly obvious that there was a block in the circulation. There was no tenderness in the popliteal space or anywhere in the leg, but as the sharp pain had been in the calf it was thought that the block might be high up in the posterior tibial or even in the popliteal artery. The patient and her friends were informed of the impending gangrene and that the removal of the tumour would have to be delayed until treatment of the leg was completed. Also it was pointed out that amputation could not reasonably be undertaken until there was a definite line of demarcation. This was awaited, the patient meantime being treated symptomatically and the leg being carefully protected against injury or infection. A little more than three weeks elapsed and a definite irregular line of demarcation appeared a little below the knee joint. On February 14th, 27 days after admission to hospital, the right leg was amputated at the knee joint there being just sufficient healthy material below the joint to adequately cover the lower end of the femur.

Progress following this procedure was good and healing satisfactory though the patient suffered much pain. On April 7th, 22 days after the amputation of the leg, supra-vaginal hysterectomy was performed for the removal of the large fibromyoma (non-degenerating), the tubes, ovaries and appendix being left *in situ*. Later progress was excellent and she left the hospital on May 10th.

Embolism involving the pulmonary artery, though fortunately infrequent, more often occurs following operations for fibroid tumours of the uterus than in any other type of surgical

* Read before the Section of Obstetrics and Gynæcology, Academy of Medicine, Toronto, February 4, 1932.

case. As such a calamity is undoubtedly favoured by some infection in the pelvic veins one is inclined to think that it does not occur so frequently now as formerly, owing to improved methods of technique which not only minimize chances of infection but spare the tissues left *in situ* from undue insult and injury. Embolism of any other type, excepting perhaps cerebral, is very rare after surgical operations and in the writer's personal experience embolism in an extremity has never followed operation except in one case of an elderly woman at whose operation he assisted the late Dr. J. F. W. Ross at St. John's Hospital, and about the same time as the case here reported was under treatment. This was an operation for the removal of a large ovarian tumour. A few days after the operation one leg became the site of severe pain of short duration and this was followed by gangrene of the toes. Fortunately this remained so limited that amputation at the mid-tarsal joint was later satisfactorily performed.

No doubt, reference to surgical literature would reveal many interesting features in regard to the subject of embolism in association with surgical cases but I have not undertaken such a study.

The main reason for reporting this case is its possible important interest from a medico-legal aspect. One can readily picture the disastrous possibilities of a suit for damages had the patient been rushed to hospital and hysterectomy performed the following day without giving heed to the solemn warning of the sudden severe pain in the leg. It is logical to believe that in some way the embolism was definitely associated with the bleeding fibromyoma and the case presents an undisputable example of embolism occurring prior to operation in an urgent surgical condition and resulting in highly destructive and debilitating gangrene.

POST-TRAUMATIC MESENTERIC OCCLUSION IN A CHILD

By ARTHUR W. HOGG, B.A., M.D.,
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This patient, aged 9 years, was first seen by me 24 hours after he had returned from school, saying he had been hit in the stomach with a baseball. He complained of spasmodic abdominal pain with vomiting. The pain and the vomiting had been intermittent. During these intermissions he felt well, wanted to eat and, in fact, wished to return to school the following morning. The mother reported that the vomitus was frothy, free from foul odour, and that there had been one good bowel movement since the onset of the symptoms.

The previous history of this patient is of interest.

He had been under my care at intervals during the previous year on account of nephrosis with chylous ascites. During that time, when he was on a high protein diet, he had had his tonsils removed, and, also, he had had an acute attack of appendicitis. The appendix was removed and recovery was normal except for drainage through the McBurney wound of chylous fluid. For several days, the abdomen would swell up, the patient would complain of severe abdominal pain, which would quickly subside when drainage of the chylous fluid occurred through the appendectomy wound. During the past winter his general condition had improved greatly and he had been in fairly constant attendance at school.

The general examination of the patient, 24 hours after being struck with the baseball, was negative, except at the time of spasmodic abdominal pains, when he would hold his abdomen and lie doubled up, crying out on account of pain. Between attacks, the abdomen was negative for tenderness, rigidity or tympanites. The urine was negative. The vomiting which would follow a drink consisted of slimy mucus. Enemata were given and at first returned a few fæcal-coloured particles and gas, with fluid of brownish colour.

The outstanding feature noted after the enemata were given was a sound from the abdomen similar to click, click, click, for about ten times. These clicking sounds could be distinctly heard by a person standing three feet away from the patient's bed. After these clicking sounds, the patient would be relieved for fifteen minutes when another spasm would occur. There was no visible peristalsis. After four hours' observation, as the enemata were proving ineffectual, and as the pains were increasing in severity, exploratory laparotomy was performed at Misericordia Hospital, with the diagnosis of intestinal obstruction.

When the peritoneal cavity was opened dark sanguineous fluid gushed out, and the lower loops of the ileum were seen to be of a purplish black colour. The connecting mesentery of these loops was a similar colour, thickened, very turgid and very stiff. There was no distended bowel. On account of the great stiffness of the mesentery, the delivery of the discoloured bowel was made only with difficulty. When delivered, this bowel proved to be the distal 40 cm. of the ileum excepting the 2 cm. nearest the cæcum. The attached mesentery was thickened and turgid almost to its root. The damaged bowel was resected and the ends of the normal bowel were brought through the wound and clamped.

The patient was sent back to the ward in poor condition and about three hours later went into a condition of shock. Intravenous treatment brought on temporary improvement, but he died from post-operative shock eight hours after operation.

From the reports in the literature these cases usually end fatally and the specific diagnosis is scarcely ever made previous to operation.

NEPHRECTOMY FOR PYONEPHROSIS IN A CHILD OF ELEVEN MONTHS*

BY EMERSON SMITH,

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It has been amply demonstrated that the diagnosis and treatment of urological conditions in infancy is similar to that of adults. Pyonephrosis treated successfully by nephrectomy in children under one year of age is rare according to literature. Kokels[1] reports two cases of pyonephrosis in children—one a female, aged ten months, and a male aged six weeks. An accurate diagnosis by cystoscopy was not made and a nephrectomy was performed transperitoneally. Mixter's[2] case was a female aged nine months. The diagnosis of pyonephrosis was made by cystogram, and the kidney was removed through a lumbar incision. Hyrntschak's[3] case was a female aged six months with an ectopic right ureter opening in the vagina, and pyonephrosis. A successful lumbar nephrectomy was done. Hyrntschak reviewed the literature and found five cases of pyonephrosis in infants under one year that were cured by nephrectomy—one each by Fälle, Von Brüning, Holländer, Kielleuthner, Maass and Widenhorn. In the Thomas and Birdsall series of urological conditions in 62 infants, 4 were under one year of age. In this series 5 nephrectomies were done with recovery in 3 cases. The ages of these operative cases were not given.

The following case is of interest as it brings the series of reported successful nephrectomies for pyonephrosis, in infants under one year of age, to ten.

Grace T. (Hosp. No. 31836), was admitted to the pædiatric service of Dr. D. B. Leitch of the Royal Alexandra Hospital on October 10, 1930, as suspected case of poliomyelitis. Her age was ten months. The chief complaints were—prostration, fever, rigidity, of five days' duration.

The *family history* was unimportant.

Personal history.—Birth, full term; normal delivery; weight 5 lbs. Some indigestion at six months, but no history of urinary trouble. Her weight was 18½ lbs.

Present illness.—She was apparently perfectly well until five days before admission, when she became ill suddenly and was much quieter than usual. She gradually became pale, vomited, and had a temperature of 103° F. There was very little change in her condition for the next four days, except that she did not want to be disturbed and seemed more rigid. The abdomen did not become distended until the day of admission. The bowels, up to that time, had been regular. No urinary symptoms were present. No dyspnœa or cough.

Physical examination.—The patient appeared to be an extremely sick infant. She was pale in colour, took very little notice of her surroundings, and lay with her head somewhat retracted. The body was extremely rigid and the abdomen markedly distended. Temperature 104° F. The head appeared large for the size of the body. The fontanelle admitted three fingers, and was tense and bulging. Attempts to flex the neck caused considerable distress. The chest showed no definite physical signs on admission. The abdomen presented such marked gaseous distension that no ab-

* Read at the annual meeting of the Canadian Medical Association, Vancouver, June 26, 1931.

normalities could be made out. The knee-jerks were hyperactive. Twenty c.c. of clear spinal fluid were withdrawn, under considerable pressure, with a cell count of 4.

Laboratory findings. — White cells 12,600; erythrocytes, 4,000,000; polymorphonuclears, 79 per cent; lymphocytes, 13 per cent; eosinophiles, 8 per cent; hæmoglobin, 85 per cent. The urine was normal—clear, amber, acid, 1016; no albumin; no sugar. Microscopically, no pus, no blood, no casts.

Blood chemistry.—Non-protein nitrogen 30 mg. per 100 c.c.; urea 12 mg. per 100 c.c.; creatinin 0.7 mg. per 100 c.c. The Wassermann test was negative.

During the next two days the infant became somewhat brighter and took her feedings better. Later, the fontanelle again became tense and another 20 c.c. of clear fluid were removed, with a cell count of 3. There was at no time any evidence of paralysis. The abdominal distension was also becoming less marked, and a few days later a small but definite mass was palpated in the left loin, just below the costal margin. This mass was evidently kidney and not spleen. No tumour was made out on the right side. The infant was beginning to cough and examination showed rather indefinite signs of congestion at right base.

During the next two weeks the general condition of the child gradually improved. The chest condition disappeared and the temperature came down to normal, but the white blood count was 16,600; polymorphonuclears, 72 per cent; lymphocytes, 25 per cent; eosinophiles, 2 per cent. The tumour mass on the left side had, however, gradually increased in size to such an extent that by the first of November it was the size of a grape-fruit, distinctly movable, and separate from the spleen. On November 4th the patient was referred to the Urological Department for further examination.

November 5th, cystoscopy (light ether anæsthesia) showed the urethra to be normal; bladder mucosa normal. There was no evidence of foreign body, new growth or inflammation. The ureteral orifices were normal in contour and position. Both ureters were catheterized with ease. Urine (right) no pus; culture negative. Urine (left) pus +++; culture gave *B. coli.*

A skiagram taken with a catheter in the left ureter, and a pyelogram (left), demonstrated a large pyonephrosis on the left side. A smear for *B. tuberculosis* was negative. Diagnosis—Left-sided pyonephrosis.

The left ureteral catheter was kept in position for four days and the mass in the left loin diminished slowly to about two-thirds of its former size, when it remained stationary. Nephrectomy was advised and on November 9th was performed by the lumbar route. A large adherent and infected kidney was found, identified and mobilized with difficulty as the anterior surface was very adherent to the peritoneum. The ureter was freed and examined. It was dilated to the size of a cigar. It was noted that the renal artery came off from the aorta at the level of the third lumbar vertebra. The kidney was removed and the wound closed in the usual manner, with a cigarette drain left in position. The patient returned to the ward in excellent condition with no evidence of shock. She made an uneventful recovery and was discharged twenty-five days after operation.

Pathological report (S. No. 16730). Dr. E. Morton Hall).

The specimen was a left kidney from a child 11 months old. It was very much enlarged, measuring 9 cm. from pole to pole, 5 cm. in width, and 4 cm. antero-posteriorly. The contour was irregular. The upper third of the kidney was pale, lobulated and the capsule stripped off readily. The lower portion was bulging and mottled brownish in colour. The capsule was thickened with inflammatory infiltration and adherent. The pelvis was very large and contained free pus. The ureter was dilated and the wall thickened. Gross section of the kidney showed marked distortion of the markings, with dilatation of calices. The inferior portion of the kidney was replaced by a large abscess into which the lower calyx opened. The kidney tissue of the upper third of the kidney was pale greyish in colour, showing diffuse cloudy swelling. Microscopic sections of this portion of kidney showed miliary abscess formation and diffuse infiltration with pus cells. The tubules contained pus and the tubular mucosa showed marked necrosis. Sections through the pelvic wall and ureter showed a similar infiltration with pus cells.

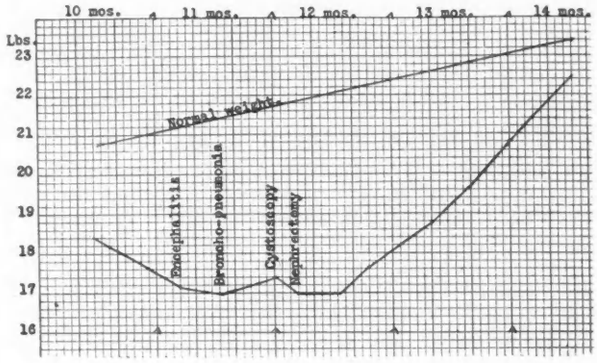
Diagnosis.—Acute suppurative pyelitis and

ureteritis with marked dilatation of the pelvis and ureter (pyonephrosis); acute suppurative nephritis with abscess of inferior renal pole; acute perinephritis.

COMMENTS

Malformations of the kidney and ureter often lead to improper drainage and as a result stasis and infection usually occur. Many cases of pyuria in the young which have existed over a period of time are due to developmental anomalies. The apparent course of events in this case was dystopic left kidney (80 per cent of dystopic kidneys are on the left side), with resultant poor drainage, hydronephrosis, and later pyonephrosis. The ureter being completely obstructed by kinking prevented infection occurring in the bladder. There are several interesting points to be noted. The patient ran a persistently febrile course (white blood cells 12-16,000). The only positive finding on ordinary physical examination was a mass in the left loin. The urine did not contain pus. Cystoscopy was essential in making an accurate diagnosis of pyonephrosis and autonephrectomy occurring in a dystopic kidney. The absence of shock during and after the operation was rather unexpected and outstanding. The rapid recovery to normal weight from 17 lbs. to 22 lbs. in three months is well shown on the accompanying chart.

CHART I



In conclusion, it is apparent that close co-operation between pædiatric and urological services is essential in the proper diagnosis and treatment of diseases of the genito-urinary system in children.

SUMMARY

1. Pyonephrosis in female infant aged 11 months, diagnosed pre-operatively and cured by nephrectomy.

2. This brings the series of reported cases to ten.

REFERENCES

1. KOKELS, *Surg., Gyn. & Obst.*, 1918, **26:** 681.
2. MIXTER, *New Eng. J. Med.*, 1928, **199:** 275.
3. HYRNTSCHAK, *Wien. klin. Wchnschr.*, 1930, **43:** 169.

Clinical and Laboratory Notes

THE PASSAGE OF CHOLESTEROL THROUGH THE GALL BLADDER MUCOSA*

A PRELIMINARY REPORT

BY A. L. WILKIE, M.D. AND HENRY DOUBILET, M.D.,

Montreal

Into dogs' gall bladders where the cystic ducts were ligated and the bile contents emptied common duct bile of known cholesterol content was introduced. After 24 hours the total content of the gall bladder was analyzed for cholesterol. The blood cholesterol was checked throughout the experiments.

The following conclusions were deduced.

1. In normal animals, with the cystic duct tied, when the cholesterol concentration of the bile is lower than that of the blood, cholesterol passes from the blood through the gall bladder mucosa into the bile.

2. When the cholesterol concentration of the bile is higher than that of the blood, cholesterol passes from the bile through the gall bladder mucosa into the blood stream.

3. The amount of cholesterol passing through the mucosa and the direction of its passage apparently depends upon the blood bile cholesterol ratio.

* From the Department of Surgery, McGill University. Based on a paper read before the Halstead Society in Montreal, 1931.

HUMORAL TRANSMISSION OF A CHORDA TYMPANI HORMONE*

BY B. P. BABKIN, ARMINE ALLEY AND GEORGE W. STAVRAKY,

Montreal

If a small dose of physostigmine is introduced intravenously into an animal under

* Read before the Montreal Physiological Society, March 28, 1932.

anæsthesia, stimulation of the peripheral end of the severed chorda tympani produces after a certain latent period a sharp fall of blood pressure. This phenomenon was attributed to the liberation from the submaxillary gland during stimulation of some substance which has the effect of a parasympathetic drug and which is prevented from destruction in the blood by physostigmine. In the investigation of one of the phases of this problem it was demonstrated that in a physostigminized cat, with both submaxillary ducts cannulated and the chorda tympani and sympathetic nerves on both sides severed, stimulation of the chorda on one side produced a fall of blood pressure, and increased the secretion and accelerated the blood-flow in the opposite gland. Lowering of the blood pressure by arterial bleeding did not produce such an effect. Tying of the glandular vein on the stimulated side prevented this effect. The phenomenon was observed after tying of the aorta and vena cava inferior below the heart in the chest. Hence it was not due to a change in the output of adrenaline. Under analogous conditions the effect of the chorda tympani hormone could be demonstrated likewise in the case of the paralytic secretion of the submaxillary gland.

A SENSITIVE COPPER SOLUTION FOR GLUCOSE ESTIMATION

BY V. J. HARDING AND C. E. DOWNS

A. 13.0 gm. $CuSO_4$. $5H_2O$ per litre.
B. 24.0 " Rochelle Salt.
40.0 " Na_2CO_3 (anhyd).
50.0 " $NaHCO_3$.
36.8 " K Oxalate.
1.4 " KIO_3.

Each salt is dissolved separately in the minimum amount of water, mixed at 25° C and the mixture made to 1 litre.

C. 10 " Ki per litre.
D. N/1 H_2SO_4.
E. N/200 Sodium Thiosulphate.

Equal quantities of A and B are mixed for daily use and form the sensitive copper solution. In hot weather the solution rapidly loses sensitivity but the separate solutions are stable at ordinary or low temperatures. Two c.c. of the sensitive solution and 2 c.c. glucose (or other reducing sugar) solution, not containing more than 0.02 per cent are mixed in a hard glass test tube (6 x 5/8), stoppered with absorbent cotton and heated exactly 10 mins. in a rapidly boiling water bath. A similar tube with water instead of sugar solution is heated under the same conditions. Cool to 25° C. Add 2 c.c. KI solution. Mix, add 2 c.c. N/1 H_2SO_4. Agitate. Titrate excess I_2 by N/200 Thiosulphate (starch indicator, or starch in phenol red). The difference between the control tube and the sugar tube represents c.c. I_2 used by Cu_2O formed by reduction. One mg. glucose = 8.65 c.c. N/200 Thiosulphate solution. Duplicate titrations should agree within 0.02 c.c. Thiosulphate.—*Can. Chem. and Metallurgy*, 1932, Vol. **16**, No. 1.

THE VAPOUR PRESSURE OF THE ALVEOLAR AIR*

BY RONALD V. CHRISTIE,
Montreal

A dew point method was described by which the vapour pressure of the alveolar air and of artificial systems could be measured to within 0.2 mm. of Hg. An average value of 45 mm. of Hg. was obtained by this method, 2 mm. lower than the theoretical value generally used in calculation of hæmo-respiratory exchange. The reasons for this discrepancy were analyzed in some detail; 0.5 mm. were due to lack of equilibrium between blood and alveolar air; 0.6 mm. to the difference between lung and rectal temperature; and 0.15 mm. to the lowering of vapour tension by the salts in solution in the blood; 0.75 mm. remained unexplained.

Variations in the alveolar vapour pressure were found to parallel variations in rectal temperature. It was found also that hyperventilation could lower the alveolar vapour pressure to as low as 38 mm. The significance of this in any accurate analysis of hæmo-respiratory exchange during conditions of work and at high altitudes was discussed. With rapid and shallow breathing, an analysis of the CO_2 and H_2O pressures gave a striking indication of the efficiency of this type of breathing in the elimination of heat with the conservation of CO_2. An explanation of this phenomenon can be made if Krogh's, rather than Haldane's, conception of the respiratory dead space be accepted. The application of this observation to the absence of alkalosis in thermal polypnœa and the rapid and shallow breathing of lobar pneumonia was discussed.

* From the University Clinic, Royal Victoria Hospital, McGill University.

Read before the Montreal Physiological Society, March 28, 1932.

Editorial

B.C.G. TO DATE

IT has been the policy of this *Journal* to report editorially on papers of merit appearing on the subject of B.C.G. vaccination and to attempt to take an impartial, if conservative, view of the whole question of the advisability of vaccination of cattle and man with this living tubercle bacillus vaccine. Of recent months several papers of merit have appeared and it is the purpose here to review these with the object of determining whether these would lead to any change in attitude. It will be remembered that the question has now largely been reduced to such considerations as (1) whether the organism is avirulent, and under this head, to quote *The Lancet*, may be considered as subdivisions: (a) whether there are risks inherent in the use of living vaccines which cannot be guarded against in a well organized laboratory; (b) if there are such risks are these worth taking in any given community? and (2) whether B.C.G. protects in a way that a dead vaccine cannot? Under this heading should be discussed the whole question of the method of administration, *i.e.*, whether by mouth, intravenous, subcutaneous, etc., and the duration of the immunity.

A series of papers by Griffith and Buxton[1] and A. Stanley Griffith[2] attempt to answer many of these questions. As these authors are well known authorities their opinions carry much weight, Griffith being one of the outstanding workers on tuberculosis in Great Britain and Buxton the Professor of Veterinary Medicine at Cambridge University.

To begin with, Griffith emphatically states that his strain of B.C.G. which has been subcultured by him on egg medium for upwards of eight years is without virulence for the monkey and calf and guinea pig. Boquet[3] has also been unable to increase the virulence of the organism by growing it on fluid media containing rabbit serum, as reported by Sasano and Medlar[4]. To explain the contrary findings of other observers one has either to assume that the particular strain of B.C.G. with which they worked was different from that used by Griffith and Boquet or that their cultures were contaminated either in the original laboratory or in that of testing. It would seem in view of the Lübeck disaster that one should require not only a well organized laboratory but a special, isolated one. The question as to whether this method should be instituted in a given community must be judged by the facilities for satisfactory distribution of the tested vaccine and by the success of already existing modern methods for controlling tuberculosis.

Does B.C.G. protect in a way that a dead vaccine cannot? Griffith was unable to obtain in monkeys the marked protection noted by Wilbert; in fact he got very little protection. On the other hand, his experiments in calves, both by feeding and more especially by intravenous inoculation, were quite striking. The monkey and guinea-pig undoubtedly belong to the group of animals which have no natural immunity to the tubercle bacillus, while the cow has some innate resistance. In the latter group of animals an increased resistance is obtainable by vaccination, while in the former little effect is produced. Exactly to what category man belongs is uncertain. Of non-living tubercle bacillus vaccines the heat-killed organisms have been most extensively used, and Petroff and Stenken claim as high a resistance in guinea-pigs, using such a vaccine, as with B.C.G. On the other hand, in calves, Griffith's results are ahead of what has been claimed for a heat-killed vaccine. But is killing by heat the ideal way for preparing a non-living tubercle bacillus vaccine? Recent work by Seibert indicates that the antigenic power of tubercle

1. Buxton and Griffith, *The Lancet*, 1931, **1**: 393.

2. Griffith, Medical Research Council Special Report No. 152, *The Lancet*, 1932, **1**: 303 and 361.

3. Boquet, *Tubercle*, 1931, **13**: 62.

4. Sasano and Medlar, *Am. Rev. Tuberc.*, 1931, **23**: 215.

protein is destroyed by heat and it is very likely that some other method of killing may be more efficacious. Other points stressed by Griffith are worthy of note. Regarding the method of administration he considers the intravenous the best, but finds that if very large doses are given by mouth the organisms do enter the body and protection is established. His B.C.G. vaccines were all freshly prepared from very young (5 day old) cultures on solid egg medium, and he considers that if a living vaccine is to be used one should take all possible steps to ensure as many organisms as possible being alive.

The recent studies of A. C. Rankin[5] and his associates in Alberta are also important, as they show that B.C.G. administered to cattle is harmless, can produce a considerable degree of immunity, and acquires no virulence on passage through these animals.

If one may attempt to summarize the result of these recent experiments by capable investigators one may say that certain strains of B.C.G. are avirulent and that freshly prepared vaccines from young cultures on solid media have an immunizing action on calves, even if given by the mouth, but the dose must be large in this case.

The question of the duration of B.C.G. immunity is not yet settled, but even if this proves to be but a year or two the method should not be discarded on this account alone, but should be employed for tiding the newly born over its most susceptible period until its own acquired immunity is established.

In conclusion, if B.C.G. is used let its use not stop the search for an equally efficacious non-living tubercle bacillus vaccine; let us start with a proved avirulent strain and require that special extreme precautions be taken in its preparation in all centres from which it is distributed. If given by mouth, let us give large enough doses to be effective, and let us be sure that the vaccine contains the maximum possible number of living organisms.

ARNOLD BRANCH

5. Rankin, Ower, Shaw, Talbot and late H. M. Vango, *Canad. J. Res.*, 1932, **6**: 77.

SKI-ING IN ITS MEDICAL ASPECTS

WINTER brings with it its own train of woes, medical as well as other. Some of these are connected with sport, which, desirable and praiseworthy, as it is, is apt, we should remember, to exact a certain price. The advent of Spring usually causes us to look forward, yet it may also be permitted to inspire a look backward. We may, properly, "take stock," as it were, and so are impelled to consider briefly in what ways winter sports are beneficial and in what ways they may be harmful. The first aspect of the case needs but little elaboration. Winter sports in general, by bringing the sportsman into a new environment, into the pure air and bright sunlight, into a contact with Nature, leaven the mind and body with a new vigour. They harden the muscles to meet unusual effort; they train the mind to skill, perseverance and resourcefulness. To break with the monotony of one's every-day vocation means much, and the very alternation of effort and repose is of advantage. Thus far we are in the realms of physiology. But we may stray into the paths of pathology.

There seems to be a fashion in sports as in most other things. In Canada it used to be snowshoeing and skating, then it was toboganning, and now it is ski-ing. The popularity of ski-ing to-day is enormous and is steadily increasing. In certain northern countries of Europe ski-ing has been found to be a very practical mode of locomotion, and it has also been found useful as a means to an end, as, for example, in mountaineering, but, of course, both in Europe and in America it may be pursued merely as a pastime. The popularity of ski-ing as a sport is perhaps to be explained by its comprehensive character. The range and freedom of snowshoeing and skating are there and, in addition, there is the joy of sliding and jumping—in short, the thrill of speed.

From the standpoint of the medical man the forms of ski-ing may be divided into two distinct categories. Climbing and long-dis-

tance running have medical connotations; down-hill sliding, ski-joring, and jumping have surgical connotations. In the former group the movements involved are mainly concerned with progression in a straight line, or, if in a curved one, are yet slow and well under control; in the latter they are quick and, badly under control, especially when there is an abrupt change of direction. Consequently, in the former the disability is apt to take the form of exhaustion and cardiac over-strain, while in the latter we meet with abrasion, laceration, contusion, concussion, sprain, dislocation and fracture. In connection with the surgical disabilities speed and alteration of the line of projection seem to be the controlling factors. Statistics from Switzerland show that the injuries listed in the second group are more than one hundred times as common as are the disabilities of the first group. This would seem to indicate that most of the people in that country who go in for ski-ing do so for the sake of downhill gliding and not for climbing or flat-racing, and the same would seem to be true for Canada.

Disabilities on the side of the heart are said by Oscar Hug, of Zürich, to have been much commoner twenty or thirty years ago than they are now, in spite of the fact that nowadays the runs are sometimes much longer, the speed is greater, and the number of contestants has enormously increased. Henschen, in Sweden, in the 90's of the last century, by percussion methods found dilatation of the heart in as high as thirty per cent of ski-racers. In contrast with this, Hug and his associates, using the more perfect orthodiagraphic methods, did not find one case of cardiac dilatation among the racers at the Olympic winter games at St. Moritz in 1928. Rather unexpectedly, it was found that the hearts of racers were even smaller immediately after the contests than before, and, moreover, the greater the effort, the smaller the heart. This surprising result is to be attributed to the careful physical training to which the contestants submit themselves beforehand. As a corollary, we may infer with certainty that no one should undertake long-distance runs and hill-climbing who has not been specially prepared for it, any more than one would enter a boat race "green."

In the case of descents, slalom, and jumping, on the other hand, the matter is one of skill rather than endurance. Smoothness and promptness in coordination between nerves and muscles and the correct statics of the articulations here play a decisive rôle. Excessively violent pressure and traction, suddenly applied, can disrupt the normal anatomical relationships. The chief cause of this excessive pressure or traction is the great speed with which the body hurtles through the air, followed by the sudden stop. In a steep descent or a big jump this speed has been shown to reach on occasion fifty or sixty miles per hour. That injuries due to this cause are not more frequent or more serious, as we would expect *a priori*, is explained by the fact that the majority of falls occur tangentially rather than at right angles to the receiving surface, so that the force of the impact is greatly mitigated. The injuries found are usually those due to pressure caused by the body striking the ground too vertically, as for example, fractures of the femora, and the traction injuries, those due to a twist when the direction of movement is suddenly altered, which include sprains, twists and fractures. The latter type of accident is less serious, as a rule, than the former. With regard to the distribution of the injuries, the figures of Bernhard, v.Saar, Hug, and Knoll agree that the lesions are more common in the parts of the body nearest the skis. The lower extremities are affected in 68 per cent of cases. Serious injuries to the head or abdominal organs are very rare. The region of the ankle is involved in 31.5 per cent and the knee in 26.5. In general, injuries to the joints are much more numerous than fractures of the bones. Fortunately, the majority of injuries due to ski-ing can be completely cured, so that the sport can be taken up again safely, to the extent even of racing and jumping.

A.G.N.

Editorial Comments

Hospitals in Canada and their Participation in Health Activities

The January issue of *Nosokomeion,* the official organ of the International Hospital Association, contains an informative article by Dr. Harvey Agnew on Hospitals in Canada and their Participation in Health Activities. Dr. Agnew is not only the Secretary and Director of the Department of Hospital Service of the Canadian Medical Association, but also represents Canada on the Editorial Board of *Nosokomeion.* He is a well known authority, therefore, on hospital matters and has done good service in introducing in a clear straightforward way the hospital situation in Canada to an international audience.

Canada is a large country with a relatively small population, for the most part concentrated into several very large cities and clustering towns, strung out along river valleys and lines of railway, but speedily thinning out as one proceeds north. Under such circumstances the problem of supplying adequate medical and hospital service is fraught with peculiar difficulties. To some extent the situation has been relieved by the introduction of the radio and the aeroplane. We are thankful to learn, on Dr. Agnew's authority, that, despite some shortcomings, the hospital system in Canada is on the whole fairly satisfactory.

Dr. Agnew, after a short delve into history, deals with the responsibilities, control and financial support assumed in hospital matters by the various governments, federal, provincial, and municipal. He considers the scope and work of the various types of hospitals found in Canada—public, rural, union, municipal, Red Cross, and the institutions maintained by certain religious bodies. He pays a well deserved tribute to the Red Cross and comments on the unique service provided by the Anglican Church in the form of a Hospital Ship which serves the fishing villages and coastal lumber mills of British Columbia.

The service to the community in general health matters of the hospitals situated in the large cities is considered sympathetically and with approval. It is clear that the large general hospitals are taking a wide interest in the health problems of their local communities. Nearly all have active out-patient departments, and cooperate with provincial and municipal authorities in the operation of venereal, pulmonary, and diagnostic clinics. Most of the large hospitals, also, maintain their own social service departments, and an increasing number provide isolation, tuberculosis, and psychiatric annexes.

Dr. Agnew remarks that "there is no system of compulsory or voluntary health service of a national character in Canada, although certain local arrangements in various districts are somewhat similar to the methods developed abroad." He points to the important fact that the extension of the hospital system to the remoter and comparatively undeveloped parts of Canada has done much to aid and expedite the settlement of these regions.

There are certain undesirable features in our system. For example, most of the cost is borne by the patient when he can least afford to meet it; hospitals face unnecessary deficits; there is lack of adequate accommodation for convalescents, chronics, incurables, isolation cases, and for addicts to drugs and alcohol. In the establishment of new hospitals, which so often are the outcome of private charity and initiative, it would follow, we might add, that there could be, with advantage, a closer cooperation between the promoters of these enterprizes and the local and provincial authorities so as to ensure proper construction, proper location, and proper adjustment to the common needs.

Dr. Agnew's article puts in a clear and succinct way much information that would be of value to physicians and hospital boards everywhere.

A.G.N.

The Patent Law of Great Britain in Relation to Medical Research

In the London Letter, published in this issue, Dr. Alan Moncrieff calls attention to an unfortunate state of affairs that exists in connection with recent discoveries connected with vitamin D that have emanated from the laboratories of the National Research Council. As is now generally known vitamin D can be produced in a highly potent form by the ultraviolet irradiation of ergosterol, and it is thought that the vitamin itself has been isolated in pure form in the so-called "calciferol." This work was conducted in British laboratories, by British workers subsidized by public moneys. The great practical value of the discoveries is obvious. These discoveries were made free to the world by publication and manufacturing firms were thus given the opportunity of bringing their benefits to the public. It was found, however, that action by the manufacturers was hampered by the claims made under a British patent (No. 236197) which had been granted to a foreign worker, Professor Steenbock, of Wisconsin, U.S.A., some years earlier. This situation has given

great concern to the Medical Research Council, who are charged by H. M. Government with the duty of directly promoting medical research, and naturally wish to facilitate the stages by which the results of medical discovery are brought into practical application. Accordingly, they have presented their arguments and conclusions in regard to this matter and the whole general question of medical patents in a memorandum submitted to the President of the Board of Trade for consideration by the Departmental Committee on the Patents and Designs Acts and Practice of the Patent Office, 1929-1931.

The Council remarks that "in practice little use of the Patent Law, is, as a rule, made by medical research workers. There is a strong professional tradition against patenting, which arises from ethical objections taken to any monopoly in the fruits of medical discovery or to private profit being derived from them. Even where it may be admitted that patenting for purely defensive purposes, or with a view to gaining some useful control in the public interest, is unobjectionable, there is an absence of the usual inducement to take out a patent in the case of a medical worker who considers himself debarred from making pecuniary gain himself. In the Council's view, importance must be attached to this attitude of the medical profession, and it will be noted that its effect is to make the law operate in the medical field capriciously in favour of the few who take advantage of it and find themselves unobstructed by rival claims. It cannot be said that the Patent Law has had any significant effect, in this country and in the medical field, of stimulating the work of discovery."

The patent rights granted to Professor Steenbock, and since made over to his University, which proposes to make a profit from them, were based upon a very imperfect knowledge of the subject matter; they covered the production of a substance of undetermined composition from an unknown constituent of certain complex materials by an action not then understood. The patent was, according to the Council, drawn in wide general terms, so that it is claimed that it covers all the applications of the more definite discoveries of subsequent date. The Council holds that what Professor Steenbock did in effect was to patent a law of nature, and that, without denying him credit for the particular step he took, it would seem wholly unreasonable that he should acquire the power to control the results of so much previous and so much subsequent work. In the case of biological and medical discoveries the discoverers are indebted to the workers of the past for the substratum on which to build, and they cannot always foresee what practical benefits may accrue to their own work. In the inorganic field, on the other hand, patented inventions have to be, because they can be, more exactly defined and do not necessarily stake out claims by which further research by others in the same field may be discouraged or hampered.

In view of these considerations, which are greatly extended and supported by argument in the Memorandum, the Council is of the opinion that the Patent Law in practice works mischievously, because of the undue advantage obtainable by the few, mainly foreigners, who resort to it; and that this situation, if not remedied, is likely to have a very harmful effect upon medical research work. They urge, therefore, that the most serious consideration should be given to the question of seeking changes in the existing law which would secure either the total abolition of the right of patenting in the medical field or some nearly equivalent restriction of that right. A.G.N.

The National Research Council of Canada

The fourteenth annual report of the Research Council of Canada for 1930-31 has just been received, and proves interesting reading. It covers an amazing range of topics and provides much food for thought. The President, Dr. H. M. Tory, calls attention to the remarkable fact that, despite the depression and the consequent urge to lessen working expenses, research work in connection with the greater industries, especially in physics and chemistry, has not only not been curtailed but in some cases has actually been increased, and, furthermore, that government research agencies everywhere report appeals for assistance and guidance in excess of those previously received. This testifies to the importance which the heads of important industries attach to research along their special lines. All this is encouraging as it will prove of valuable assistance in the gigantic task of rehabilitation. As an example of the importance of research Doctor Tory states that as a result of certain researches conducted under the ægis of the Council an important industry has been reestablished, which in spite of the adverse circumstances has steadily improved its output and has established a market for its products not only in Canada but also in Britain and the United States. Not only so, as a result of this, the railways have benefited to the extent of $100,000 on account of increased carriage of freight, and the value of the coal consumed was increased by $35,000.

The range of the studies carried on under the direction of the Research Council is impressive. No less than twenty-nine research committees are now in operation, and their activities cover

such subjects as aeronautics, animal diseases, apple slacks, asbestos, biophysics, botany, chemistry, coal, electrical measuring instruments, engineering standards, field crop diseases, gas research, grain research, heating and insulation, honey, laundry research, leather, magnesite, mining and metallurgy, forest investigations, nitrogen fixation, oceanography, patents and awards, physics, radio, Trail smelter smoke, tuberculosis, weed control, and wool. Truly a comprehensive list!

Researches of special interest to medical men are those being conducted on tuberculosis, particularly in connection with BCG; mastitis in cattle; the parasites infecting fowls; and the paralysis of fowls. The findings in connection with BCG are very conservative and a comprehensive program of study on this important question is mapped out. The committee is, in fact, looking for more light. The work on bovine mastitis is being carried on at the Agricultural Institute at Oka by Dr. J. M. Rosell, in the hope of devising a protective and curative vaccine. A beginning has been made in the study of the parasites of fowls at the Macdonald College, Ste. Anne de Bellevue, Que., with the cooperation of the provincial government and McGill University. A move is on foot, also, to extend this work, under the auspices of the Research Council of Canada, the provincial government of Quebec, McGill University, and the Empire Marketing Board, and the hope is expressed that Macdonald College may become the centre for the British Empire for this branch of research. Paralysis of fowls, a disease that seems to be making some headway, especially in British Columbia, is being carefully studied in that province. There can be no question, after reading the report, that the Research Council of Canada is proving of immense benefit to Canada and we hope it may be continued in full strength that the country may continue to receive its guidance and help in matters connected with scientific industry. A.G.N.

Dr. I. M. Rabinowitch, D.Sc.

We learn with much pleasure that Dr. I. M. Rabinowitch has recently been honoured by McGill University with the degree of Doctor of Science. This is the highest degree in science that the university confers, and it is one which is very jealously guarded; it is five years since the last award. Dr. Rabinowitch's work in metabolism is too well known for us to dwell on it here. Several of his numerous papers have appeared in our columns. As director (and founder) of the department of metabolism at the Montreal General Hospital he has built up the largest diabetic clinic in Canada, and the second largest in North America. We join with many others in congratulating him on the well deserved recognition he has received from his Alma Mater. H.E.M.

Warning

A well-spoken Englishman with a very suave manner, who has been travelling as a book salesman for a number of reputable houses in Canada, has borrowed money from quite a number of doctors under what appears to be false pretences. A long list of claims have been made known to us, and as far as we can ascertain, this man has not the slightest intention of repaying any of these debts. Reputable book salesmen, representing the various houses in Canada do not borrow money from their doctor clients on the pretence that they will pay it back again in a few days. Beware of this man if he calls upon you.

WEE MODERNS

BY BERTON BRALEY

The babies of these present days are raised upon a system,
You count their calories of food and on a card you list 'em;
They're spanked upon a schedule and petted by the clock
And you mustn't ever jounce 'em and you mustn't ever rock;
Physicians choose their style of dress and fix their hours of sleep
And tell you when they ought to laugh and when they ought to weep,
Their every eccentricity is catalogued and filed
For the modern type of baby is a scientific child!

Time was that mother raised them in a rather casual way,
With a bit of help from grandma—but that isn't done to-day;
The bringing up of babies is a far from simple art
And you need a dozen volumes and a blueprint and a chart
A clinical thermometer, a stethoscope, a scale
Some test tubes and a dictaphone that registers each wail,
The modern mother's regimen is very far from mild,
For the baby of the present is a scientific child!

Oh yes, I am describing the MODERN baby now!
Oh, the old folks sniff about it and the jesters jest a lot
But the modern type of baby is a healthy little tot,
He may be robbed of baby-talk, of many pats and kisses,
But there's a heap of colic and other ills he misses;
And in spite of all the sentiment that in our cosmos lurks
There isn't any question that the modern method works—
For the scientific baby is a husky little tad,
A CREDIT TO THE DOCTOR, AND THE MOTHER, AND THE DAD!

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Retrospect

THE NEUROLOGICAL COMPLICATIONS OF PERNICIOUS ANÆMIA AND THE EFFECT OF LIVER THERAPY*

BY ARTHUR W. YOUNG, M.D., F.R.C.P. (C.),

Montreal

The efficacy of liver therapy in the control of pernicious anæmia is generally conceded, except when the nervous system is involved, and in recent years much controversy has arisen as to whether signs and symptoms referable to that system can be materially altered. This becomes an important issue if one considers that nervous manifestations of one kind or another occur in from 50 to 90 per cent of the cases. Woltman stated that 12.7 per cent of the cases at the Mayo Clinic sought relief for symptoms which were directly referable to the nervous system. He also said that 80.6 per cent of 150 cases gave conclusive evidence of spinal cord changes, and this statement was corroborated by Dorst at the Cleveland Clinic. The importance of recognizing the nervous manifestations associated with the disease is strikingly brought to our attention when we see patients with typical spinal cord changes in whom the blood picture does not digress far from normal.

Since Lichtheim's recognition of three cases of pernicious anæmia with symptoms ordinarily seen in tabes, Russell, Batton, Collier, Woltman and others, have made careful analyses of the nervous symptoms and the spinal cord changes. The nervous symptoms range from mild paræsthesia to paralysis. Numbness in one portion of the body, such as the tongue, lips, legs, feet or hands; burning sensations, coldness, a feeling of deadness, a wooden sensation in the limbs, with stiffness and cramps; aching pains in the back, girdle pains, tight bands about the waist and limbs, or stinging pains may occur. Often slight in the beginning and occurring intermittently, they later become very constant and extremely annoying and disabling. The limbs are frequently described as useless, without power and feeling. These symptoms are usually associated with the typical findings of subacute combined degeneration, namely, absent or markedly increased deep reflexes, bilateral plantar extension response, loss or impairment of position and vibration sense, Rombergism, increased or decreased tone of the limbs, anæsthesia of the glove and stocking type, and the ataxic or spastic gait. On other occasions the paræsthesias are the only findings indicative of nervous system alterations, and these might well be ascribed to affection of the peripheral nerves. Mental changes occur infrequently, either alone or in the presence of subacute combined degeneration, under the form of a neurosis or a toxic psychosis.

The pathological changes in the spinal cord of subacute combined degeneration, posterolateral degeneration or funicular myelosis, consist of an œdematous process, giving the cord a swollen appearance, affecting the cerebrospinal pathway in the lateral column and the tracts of gracilis and cuneatus in the posterior column, especially in the mid-dorsal area, thinning out as it ascends and descends the cord; hence the name "funicular myelosis". The process spreads, increases in size, coalesces, and soon the whole of the white matter is involved, with the exception of a narrow zone of internucial fibres which everywhere clothe the grey matter. Microscopically, the myelin sheath is tremendously swollen; large lacunæ appear; the myelin is destroyed and the axis-cylinders are left bare, soon to succumb, leaving behind a network of connective tissue resembling a honeycomb. There is little or no increase in neuroglia. Finally the ganglion cells undergo degeneration.

Early conceptions of the development of pernicious anæmia followed Hunter's view, namely, that the disease results from the absorption of poison from the gastro-intestinal tract. It was Hurst who remarked upon the absence of hydrochloric acid in the gastric secretion, and he concluded that achylia gastrica was a necessary forerunner, believing that bacteria in the food passed through the stomach unaltered because of the absence of hydrochloric acid, permitting the development of bacterial flora in the upper intestinal tract which produced neurotoxins and hæmolytic toxins. This achlorhydria is usually congenital, though on occasion it is acquired.

Cases have been described of multiple occurrence in a single family group. Dorst describes such a family in which a mother and 4 children died of the disease. Of the 6 other members of the family who were examined only 2 had a normal gastric secretion; 2 had complete achlorhydria; and 2 had very marked hypochlorhydria. None of these latter members had any abnormal blood changes. The members who died had an achlorhydria, and, therefore, in a family of 11, 9 had a lack of acid in the gastric secretion and 5 of these developed pernicious anæmia.

When the achlorhydria is acquired, as in cancer of the stomach and in resection of the stomach, one would expect the development of the disease. Such has been observed in

* From the Department of Neurology of McGill University and the Royal Victoria Hospital.

laboratory work, where gastric resections have been performed on dogs and an anæmia somewhat similar to the pernicious type resulted. However, most cases of cancer of stomach do not develop the typical anæmia, as also do not most individuals who have subtotal gastrectomies, and the gastric resections of animal experimentation are far from conclusive. Because of this contrary evidence the recent idea is to consider the achlorhydria as simply a prodromal symptom and not a causative agent for the anæmia.

A vitamin deficiency was thought to be a predisposing factor and high vitamin diets were recommended, with little realization of the possibility that when favourable results were obtained they were probably due to the liver in the diet. Following the startling results with liver, pernicious anæmia was looked upon as a deficiency disease. It was held by some that liver contained a factor which promoted the development of red blood cells, that the anæmia was more the result of impaired blood production than of increased blood destruction. Castle and his co-workers ingeniously proved by making a series of observations on human beings that "the genesis of the disease pernicious anæmia is dependent upon an inadequate gastric digestion of protein, thus permitting the development of a virtual deficiency in the presence of a diet adequate for the normal individual". The normal human gastric fasting content contains an intrinsic factor which acts on ingested protein, and an extrinsic factor preventing the development of the disease. This intrinsic factor is absent in the normal duodenal contents and saliva and also in the gastric secretion of the pernicious anæmia patient. The active intrinsic factor is an enzyme, possibly closely related to rennin, which is capable of interacting with protein (extrinsic factor), producing a material having, when administered to pernicious anæmia patients, a marked hæmatopœtic effect. The lack of this intrinsic factor in the gastric secretion of pernicious anæmia subjects is probably the essential defect in the production of the disease, through a failure of a normal reaction on ingested proteins. This discovery led to the feeding of dessicated hog's stomach in the treatment, with effectual results.

Blood changes typical of pernicious anæmia have been described in association with sprue, infestation with dibothriocephalus latus, and in persons suffering from an old constriction of the small intestine with stagnation of the contents above the constriction.

Many theories have been advanced as to the cause of subacute combined degeneration. Among the foremost is the mention of a special neurotoxin, having a special affinity for the postero-lateral columns of the spinal cord. It has been suggested that the anæmia is the causative factor, yet it is difficult to explain the presence of the nervous lesions in the absence of any anæmia and the absence of nervous changes in secondary anæmia and the leukæmias. A theory has been offered that bile salts in the blood are responsible.

It has been remarked that diets deficient in the anti-neuritic vitamin B, when fed to animals, produce a reduction in the gastric secretions and a polyneuritis and, in some instances, a spastic paralysis. Gilder, Kaltwinkel and Castle made a special study on dogs who were fed a diet deficient in vitamin B and noted, when this diet was prolonged for a sufficient time, demyelinization of the white matter of the cord and cortex and, to a less extent, of the peripheral nerves. They also remarked upon the resemblance of the cord-lesions to those of subacute combined degeneration. Symptoms of progressive weakness, stiffness of the legs, spastic paralysis and convulsions developed. There was no particular change in the gastric analysis contents, and only a slight secondary anæmia occurred.

Cord lesions similar to subacute combined degeneration have arisen in the course of toxic processes due to ergot, lead, pellagra, cancer, tuberculosis and many subacute infections. Of interest in this respect were the findings in

A male, J. P., aged 61, who died at the Royal Victoria Hospital on October 17, 1926, having pronounced signs of subacute combined degeneration, ataxia, Rombergism, loss of position and vibration sense in the legs, and bilateral plantar extension. He had an anæmia which resembled the pernicious type. At autopsy, typical degeneration, without any sclerosis, was found in the posterior and lateral columns, especially marked in the mid-dorsal region of the spinal cord. The kidneys contained many subcapsular abscesses and the glomeruli were swollen and contained leucocytes and pus cells, allowing a diagnosis of bilateral pyonephritis. The bone marrow and spleen did not depart from normal.

On reviewing the literature pertaining to the value of liver therapy in affecting the nervous manifestations of the disease, one is struck by the diversity of opinions. Curschmann states he has not observed a single case in which spinal symptoms, especially the sensory, motor and reflex disturbances, were really improved by liver therapy. He remarks upon the progression of the spinal symptoms in face of the apparent remission. Redlich, at the same discussion, concurred with his opinions, whereas Lottig and Witzleben spoke of improvement in the subjective and objective symptoms.

Minot and Murphy in their original article claimed a symptomatic improvement, especially when the symptoms were of recent origin. Fried, on the other hand, after reviewing the pathological changes and the tissue repair reaction of the nervous system, concluded that it was remarkable that any functional improvement should occur, and it was quite impossible

to expect a cure of the spinal cord symptoms or even any great improvement. Of interest is the observation made by Davison in regard to the nervous system tissue response to liver therapy. In a histological study of the spinal cord in cases of subacute combined degeneration treated with liver, he claimed that the only effect of liver therapy was to increase the glial overgrowth, whereas typical of the pathological changes without liver therapy was the absence of gliosis. No influence on the destruction of the myelin sheaths and the axis cylinders was observed. In 7 of his treated cases, only 2 showed improvement in the neurological signs and symptoms.

Murphy, in a later study, admitted the resistance of the nervous symptoms to treatment, though he remarked that recently developed symptoms yielded more rapidly and satisfactorily than those of long-standing, that the improvement was often gratifying to the patient, that with few exceptions nervous symptoms have not developed when absent before treatment was instigated, nor did the symptoms increase while under treatment. He associates the improvement with maintenance of the red blood cells at a level beyond 4 million per cm.

Davidson states that in only 5 per cent of the cases of pernicious anæmia are the very severe nervous symptoms found, whereas mild paræsthesias are present in 50 to 80 per cent, and when the symptoms are mild or of recent date and due to early disease of the nervous system they either actually disappear or are greatly improved with liver therapy. If the lesion is severe or of long standing no improvement is possible.

Richardson believes nervous symptoms can and frequently do clear up, either entirely or to a greater or lesser extent, after months or years of treatment, provided an adequate liver intake is maintained. No case of the 67 studied at the Massachusetts General Hospital developed central nervous system symptoms during treatment, with the exception of early and transient paræsthesia and neuritic pains. Of 14 cases with ataxia, 8 were completely improved; 4 were moderately so and only 2 had no improvement. Improvement took place very slowly; frequently it was not detected for 6 months or even 2 years after liver therapy was begun. He agrees with Murphy that it is extremely important to keep the red blood count at a high level. A bed-ridden case was described who had absent knee-jerks and the vibration sense. At the end of a year's treatment complete symptomatic improvement occurred with return of the knee-jerks and the vibration sense.

Ungley and Suzman compared cases treated with and without liver and they noted a marked beneficial effect with liver therapy. To tabulate:

	Liver	*No liver*
Improved	17	0
Not improved or worse	8	3
Deaths	5	28
	30	31

Improvement in the subjective symptoms, such as numbness, tingling, girdle pains and the ataxia, was the first to occur; strength gradually and progressively improved; the objective signs altered only after months of treatment. These authors noted a change from the plantar extension response to flexion in 5 out of 9 instances. Vibration sense and joint sense were very slow in returning; joint sense returned in 6 out of 10 cases. In 7 cases where a disturbance of micturition was present, this was remedied in all except one. Needles reported 11 cases treated adequately with liver, of which 5 developed signs of subacute combined degeneration despite therapy; 4 remained stationary and 2 improved. Many isolated cases have been report. Bubert, on the one hand, witnessed startling improvement in a markedly ataxic case, whereas Cohen wrote of the progression of the ataxia in a case where a remission from the anæmia had occurred.

Sporadic mention is made of the effect on the mental changes. It is agreed that the mild personality changes of stubborness, irritability and surliness do benefit, the patients becoming cooperative, placid and tractable. When, however, a true psychosis is present the effect is not so good, although Richardson reports two patients with delusions of persecution and hallucinations which cleared up.

Three cases, followed about five years, improved in regard to subjective complaints. These patients were practically unable to carry on with their work before treatment was instigated. One, a professor, could not write on the blackboard and was very ataxic. Another, in charge of a department, stumbled and wavered when he walked. The other complained of her knees giving out, of great weakness in her legs, of marked ataxia, and that she could not do house-work. To-day all three are symptomless; the ataxia, the weakness and the paræsthesias have disappeared. The physical signs which were typical of the cord disease changed in only one instance; it was in respect of the plantar extension response returning to flexion. There has been no objective return of deep muscle sense, though the ataxia has greatly improved. It is important to stress the fact that these patients persisted in the daily use of liver.

Other patients have not reacted so favourably, and when the symptoms or signs have progressed the reason seemed apparent in every instance, for the daily dose of liver was not

adhered to. One patient in a rather advanced ataxic stage improves symptomatically when liver is taken regularly, but if she interrupts it for a week or two she complains bitterly. Another patient declared she could not take liver in any form and finally arrived in a physician's hands who administered some hypodermic injection. The disease progressed and she died within 2 years of its onset, completely paraplegic.

If much success is to be obtained with liver therapy for the nervous disorders in pernicious anæmia, early diagnosis is important, as also is the persistent daily administration of liver in some form or the extract of hog's stomach.

BIBLIOGRAPHY

1. BUBERT, *J. Am. M. Ass.*, 1928, **90**: 903.
2. CASTLE, TOWNSEND AND HEALTH, *Am. J. M. Sc.*, 1930, **180**: 305.
3. COHEN, *J. Am. M. Ass.*, 1927, **90**: 1787.
4. CURSCHMANN, *Arch. Neur. & Psychiat.*, 1931, **25**: 438.
5. DAVIDSON, *Edin. M. J.*, 1928, **35**: 330.
6. DAVISON, *Arch. Neur. & Psychiat.*, 1931, **26**: 1195.
7. DORST, *Am. J. M. Sc.*, 1926, **172**: 157.
8. FITZ-HUGH, *Internat. Clin.*, 1930, **4**: 74.
9. KOESSLER AND MAURER, *J. Am. M. Ass.*, 1927, **89**: 772.
10. FRIED, *J. Am. M. Ass.*, 1929, **90**: 1260.
11. KATTWINKEL AND CASTLE, *Arch. Neur. & Psychiat.*, 1930, **42**: 639.
12. MASON, *J. Am. M. Ass.*, 1928, **90**: 1527.
13. MEINERTZ, *Deutsch. med. Wchnschr.*, 1929, **55**: 213.
14. MEULEGRACHT, *Am. J. M. Sc.*, 1925, **169**: 177.
15. MINOT AND MURPHY, *J. Am. M. Ass.*, 1926, **87**: 470.
16. MINOT AND MURPHY, *J. Am. M. Ass.*, 1927, **89**: 762.
17. MUSSER, *Folia Hæmatol.*, 1930, **42**: 254.
18. NEEDLES, *Arch. Neur. & Psychiat.*, 1931, **26**: 346.
19. RICHARDSON, *New Eng. M. J.*, 1929, **200**: 540.
20. UNGLEY AND SUZMAN, *Brain*, 1929, **52**: 271.
21. WOLTMAN, *Coll. Papers Mayo Clin.*, 1918, **10**: 933.

Special Articles

DIAGNOSIS OF TUBERCULOSIS FIFTY YEARS AGO AND NOW*

BY EDWARD LACHLAN ROSS, M.D.,

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Tuberculosis has been perhaps the earliest, the most widely spread, and the most fatal of the plagues of mankind. The "Father of Medicine," 400 years before Christ, had a remarkable understanding of its diagnosis, its treatment and prognosis. Galen recognized it as communicable. But after those days of Grecian light down to within two centuries of our own time very little progress had been made. The main clinical features of the disease in the various organs were known, but its "unity" was not known. Differentiation between tuberculosis of the lung and other chronic chest diseases was difficult. Such conditions as empyema, abscess of the lung, tumour, gangrene and bronchiectasis were doubtless often included under the name "phthisis". The association of chronic lung disease with clubbing of the fingers was well known, as the term "Hippocratic fingers" indicates. In the seventeenth century, Sylvius made some advance. In 1761 Auenbrugger published a pamphlet on percussion, but it was not until Corvisart translated it into French and endorsed it that the value of percussion in diagnosis was realized. At the end of the eighteenth century, Portal appreciated the difficulties in making a correct diagnosis. He writes: "It is by the entire picture, or at least by a joining together of most of the symptoms, that one may be able to make a diagnosis with the least chance of error . . . for there are very few (if indeed any) who can characterize phthisis sufficiently well to recognize it with certainty". In the early nineteenth century, Bayle made most useful clinical and pathological studies. In 1819, Laennec published his discovery of mediate auscultation, and besides this studied tuberculosis intensively from both the clinical and pathological sides. Laennec, in short, made tuberculosis the foremost medical study of his day. Very little can be added even now to Laennec's description of physical signs written over a century ago. In 1839, Skoda published a most complete presentation of percussion and auscultation. Villemin in 1866 inoculated animals with tuberculous sputum and found that they developed the disease, but he was unable to demonstrate the virus or transmit it from one animal to another.

As the phase of the subject this paper is intended to discuss is the diagnosis of tuberculosis fifty years ago as compared with diagnosis now, we must endeavour to find what the standards were fifty years ago. Stokes died just four years before Koch's discovery. His classic work on chest disease, published first in 1837, was undoubtedly ahead of general practice until 1850 or after, and the general practice of twenty-five years before Koch could likely be fairly represented by it. It was republished in 1880. Niemeyer in 1866 and 1867 published lectures on tuberculosis which were considered outstanding and were generally quoted long after 1882. In 1865, Ranger, in England, showed the value of the new procedure of clinical themometry in a paper on "The temperature of the body as a means of diagnosis in phthisis and tuberculosis". Later still, Wunderlich reported temperature taking as only beginning to be a routine even in the best hospitals. Ziemssen's System of Medicine, with authors from many countries, published

* Read before the Winnipeg Medical Society, March 17, 1932, in connection with the Robert Koch Anniversary.

in English in 1880, has one large volume devoted to diseases of the chest.

From such writings we get a fair idea of the teachings and principles of diagnosis at that time, but it is difficult to get out of our minds the very different ideas of 1932. Let us try to stand side by side with a physician of the eighteen-seventies, say, in Harley Street, thinking his thoughts and using his means of diagnosis only.

To begin with, our pre-Koch physician had the firm belief that the transmission of tuberculosis from parent to child was purely hereditary. Its infectiousness was only barely proved among the scientists, and had not yet got into the general thinking of the profession. Even in diagnosis this fundamental idea made a great difference. If a family history could not be shown, tuberculosis was almost excluded, cases being divided into hereditary and "accidental". A history of known exposure outside the family gave practically no clue.

Before making a physical examination our doctor of the eighteen-seventies had many questions to ask. What was the age, the "habit," the "diathesis" of the patient? Had phthisis or scrofula ever been in his family? Was this the first attack? Was he liable to bronchitis? Had the disease commenced by laryngeal, tracheal or bronchial irritation, or followed a pneumonia, a pleurisy, or a "continued fever"? Had there been hæmoptysis, and if so had it preceded or followed the other pulmonary symptoms? Was the cough at first dry or followed by expectoration? What was the nature and quantity of expectoration? Had there been a change from a mucous to a purulent character, coinciding with the symptoms of ulceration? Had any calcareous matter been expectorated? Had there been pain; if so, where, and of what kind? Had there been fever or "hectic", or emaciation, or acceleration of breathing? What was the state of the pulse? What the decubitus? What was the condition of the digestive system? How about the pharynx, the larynx, and the trachea? Was there any syphilitic taint? Was the patient, if a female, hysterical? What was the state of the "uterine system"? Had there been any external disease of a scrofulous nature?

We can now proceed with the pre-Koch physical examination. We are told explicitly that it is not necessary to bare more than the upper portion of the chest. Not much is made out by inspection. Pressure is made in the subclavicular regions to discover tenderness. Spring calipers—one knob on the scapula and the other below the clavicle are used to determine if any atrophy has taken place. Percussion is then performed delicately, and, to be of value, must be comparative. For the active signs the stethoscope (monaural) is absolutely necessary, the respiration, cough, voice and the sounds of the heart being explored.

We are assured that there are no physical signs peculiar to tubercle, that every known auscultatory sign may be met with in phthisis, and that where comparison cannot be employed there is a much greater difficulty in diagnosis. The earliest signs are those of bronchial irritation, the crepitant râle being commonest, though forced expiration and cough may be necessary to bring it out. Combined with the above in early cases there is feebleness of respiration and slight dullness. Although these signs do not differ from ordinary bronchitis they are of value in diagnosing incipient tuberculosis because of their situation, localization, and combination with dullness. Ulceration or cavitation is determined by the presence of the muco-crepitating râle or mucous rattle. There may be metallic tinkling or pectoriloquy, although the latter sign is not very dependable. The heart may be diminished in size but its impulse is usually increased. With pleuritis one may get a friction rub but "if the phenomena of dry pleuritis be rare in phthisis those of liquid effusion are still more so".

In the first stage there is cough, pain and quickness of pulse followed by emaciation, with expectoration, translucent and mucoid at first. If physical signs are absent after a few weeks the disease is likely to be tubercle. In the second stage emaciation increases, and sweating occurs, cough is loose, expectoration purulent and diarrhœa troublesome. Dullness increases, mucous râles, cavernous breathing and pectoriloquy are heard. Naturally after such a second stage the third is more in the hands of the undertaker than of the physician.

After looking over some patients with our confrère of the eighteen-seventies, our conclusions are that out of necessity he uses his eyes, ears, hands, and no doubt his head also, better than we do. While he is pondering over signs and symptoms we would be ordering laboratory tests and x-ray films. One very great disadvantage is that he can never be sure of his diagnosis except by post-mortem. He has nothing to correspond to the finding of bacilli or an x-ray film. Another very great disadvantage is that he has no possible way of making an early diagnosis. He has no way of making any kind of a diagnosis until symptoms and signs have appeared. As a result, practically the only pulmonary tuberculosis known or diagnosed or diagnosable was tuberculosis at advanced stages. Little wonder then that a diagnosis was something like a death warrant.

So much for fifty years ago. What of to-day?

The first tremendous advance is the one we celebrate to-night, the discovery of the bacillus of tuberculosis. This marked the beginning of a new set of ideas. It settled the uncertainty about the infectiousness of tuberculosis; it put hereditary transmission in its place, and taught us that it is contact and not blood relationship that counts. The finding of bacilli enables us to make a sure diagnosis, which the pre-Koch physician could not do except post mortem. Signs and symptoms are now much more exactly known, because for fifty years they could be checked up and corroborated by the absolute standard of tubercle bacilli found.

Although the tubercle bacillus does speak the final word, we of 1932 must always bear in mind that failure to find it does not negative a diagnosis, and that the finding of bacilli does not make an early diagnosis. It is, of course, a great mistake to delay a diagnosis because tubercle bacilli have not been found in one or two specimens of sputum. Of the patients now in the Manitoba Sanatorium, 18 per cent had no sputum on admission, 24 per cent had sputum negative for tubercle bacilli on at least three examinations, and in 58 per cent bacilli had been found. That is, in 42 per cent the diagnosis could not be made by sputum examination. We have a distinct advantage over Koch even in the finding of Koch's own bacillus — better staining, concentration methods and the mechanical shaker for breaking up sputum; also inoculation and cultural methods have greatly improved. Sputum should be examined repeatedly and perseveringly, as bacilli are found sometimes only after a long series of examinations. Even after repeated examinations their absence does not mean the absence of tuberculosis. When disease is incipient, quiescent and even sometimes when advanced, the sputum will often be free of tubercle bacilli. One patient with advanced chronic tuberculosis had thirty-seven consecutive negative smears, yet on the first culture tubercle bacilli were grown. Bacilli may be present in the urine or fæces and not be found in the sputum, even if the disease is chiefly pulmonary.

Another great advance in diagnosis we owe to Koch is the use of tuberculin. He seems to have understood its scope better in diagnosis than in treatment. He realized that not all who reacted to tuberculin were suffering from the disease, and also that very chronic cases as well as occasionally very acute ones, where resistance was overwhelmed, did not react. Even to-day, after forty-two years, much is still unknown about tuberculin. However, it is a diagnostic aid. A positive reaction indicates that the body has had some previous acquaintance with the tubercle bacillus, but not necessarily that active or clinical disease is present. In the adult a negative reaction is of more diagnostic value than a positive one. This is not quite so true of infants and young children, as a positive reaction then will more likely have clinical significance.

The pre-Koch doctor, to arrive at a diagnosis, had to make the most of what little he had, so gave a great deal of study to the history of the case. A good history is perhaps more helpful in diagnosis to-day even than fifty years ago. We have more exact knowledge about previous illnesses and other diseases. We appreciate more clearly the significance of pleurisy with effusion, febrile attacks, glandular disease, respiratory infections, ischio-rectal abscess and erythema nodosum or induratum. The earlier discovery of disease by other methods has given significance to symptoms that were previously not recognized. For example, alternating constipation and diarrhœa were the earliest known symptoms of intestinal tuberculosis. We now know that the first lesions are usually in the ileum and that slight constipation, slightly impaired appetite, slight abdominal discomfort, and slight irritability and nervousness are the earliest symptoms. The big element in the pre-Koch history was the history of the family. The big element in the post-Koch history is the history of contact. At the Manitoba Sanatorium at present over 50 per cent of the patients have had known contact with tuberculosis in their homes.

Before Koch a great deal more depended on physical examination than to-day. But even if so examination is much better and more exact now, because findings can be checked against bacilli in sputum and against x-ray films. Also the binaural stethoscope of to-day is a much better instrument than the old monaural stethoscope. Twenty years ago, after Koch, and before the general use of the x-ray, examination was very minute and skilful and no doubt overdone. That was the golden age of the stethoscope. The art of physical diagnosis has declined somewhat perhaps since the x-ray, but what is left is much more true. Early lesions cannot be discovered by the stethoscope, but in 80 per cent of patients who come of their own accord to consult a doctor because of symptoms produced by tuberculosis, the disease should be revealed by ordinary physical examination. In the clinical thermometer, which was scarcely in general use by the profession before Koch, we have a distinct advantage over our pre-Koch confrère.

The greatest of our post-Koch advantages is undoubtedly the x-ray. A well-taken and well-interpreted film of the chest is of more value in diagnosis than any other single measure. The pre-Koch physician had to wait for signs and symptoms, but the x-ray can anticipate signs and symptoms by months and

even by years. Disease in the chest cannot be ruled out by physical examination. A patient has not been fully examined until an x-ray film of the chest has been well made and well read. It is the only means we have of finding small and early lesions. It is a great aid in the differentiating of other chronic diseases of the chest from tuberculosis. Basal tuberculosis, which was rarely found by the stethoscope, is now no longer considered rare. Bronchiectasis and other septic and fibrotic conditions are very much less often confused with tuberculosis. The bronchial tree and cavities within the chest, both intra- and extra-pulmonary, are readily visualized by lipiodol. Tuberculosis in other organs may be recognized not only by x-ray films of those organs, but the finding of lung lesions, too old or small to be found by any other means, may be a great aid in establishing a diagnosis in some other part. By the barium meal we can discover intestinal tuberculosis, its location and extent, months before any symptoms appear, while the pre-Koch doctor had to wait, not only for symptoms but for symptoms of extensive ulceration. A barium series is considered so important in diagnosis that for twelve years it has been given as a routine to every patient admitted to the Manitoba Sanatorium with pulmonary tuberculosis.

The present understanding of tuberculosis in children is entirely post-Koch and due mainly to the x-ray. Symptoms and physical signs are not of great value in children and the main reliance in making a diagnosis has to be placed chiefly on the family history, tuberculin reactions and x-ray films.

Among the very great advantages in diagnosis of 1932 over, say, 1881, are our fundamental ideas of the infectiousness of tuberculosis, and of contact as a source, and not family relationship; the possibility of sureness in diagnosis; the possibility of earliness in diagnosis; and our knowledge of living pathology.

Since Hippocrates there have been four great advances in diagnosis—the percussion of Auenbrugger, the stethoscopy of Laennec, the bacteriology of Koch, and the x-ray of Roentgen and the latest two are the greatest two. Perhaps the greatest of all is the last.

EARNEST THOUGHTS.—To every poet, to every writer, we might say: Be true if you would be believed. Let a man but speak forth with genuine earnestness the thought, the emotion, the actual condition of his own heart; and other men, so strangely are we all knit together by the tie of sympathy, must, and will give heed to him. In culture, in extent of view, we may stand above the speaker or below him; but in either case his words, if they are earnest and sincere, will find some response within us, for in spite of all casual varieties in outward rank or inward, as face answers to face, so does the heart of man to man.—Thomas Carlyle.

THE CARE OF CONVALESCENT PATIENTS

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The subject of the care of convalescent patients is becoming one of increasing interest to both the public and the medical profession. With the comparatively high cost of hospital care requiring people to leave the general hospital before full recovery, and with our modern system of living in small houses or apartments which provide no accommodation for the sick, it is becoming more essential each year that provision be made in each community for the care of convalescent patients. More and more we are beginning to realize the tremendous monetary loss of prolonged illness and to realize that those health measures which will shorten illness should be encouraged. For the average urban dweller who cannot afford a trip south or to the sea, or who cannot go back to the family farm, the convalescent hospital is the logical solution, for convalescence can best be hastened by providing the patient with fresh air, sunlight, good food, quietness, mild recreational opportunities and, as far as possible, freedom from worry. Moreover, in most communities the general hospitals are overtaxed, especially the cheaper accommodation at the present time, and it is generally agreed that many costly enlargements to our general hospitals might not be needed were other than acute cases treated elsewhere. In a recent one-day survey of five general hospitals in Toronto by a Convalescent Study Committee, assisted by the various hospital staffs, it was discovered that of 1,426 public ward patients, 491, or 34 per cent, were more suitable for care elsewhere, in this proportion:— 19 per cent—convalescent; 13 per cent—chronically ill or incurable; 2 per cent—tuberculous.

WHAT PATIENTS REQUIRE CONVALESCENT CARE?

An easier question would read: "What type of patients do *not* require convalescent care?" From a *medical viewpoint* we could say that most patients recovering from major surgical operations, from exhausting illnesses such as influenza or pneumonia, from exacerbations of chronic debilities such as cardiac affections, from any infection or illness which has resulted in weakness, neurasthenia or psychasthenia, emaciation, or anæmia, need convalescent care. From the *economic viewpoint,* all patients coming under the above categories need institutional convalescent care who cannot afford to go away to private health resorts or who cannot enjoy a restful convalescence under ideal conditions at home or among friends; and this stipulation

includes at once the great majority of such persons. It is most desirable that the tired mother, exhausted after a severe illness or still another parturition, should not be plunged immediately into a maelstrom of endless duties and tasks, a responsibility which is considered by the census taker to be "no occupation".

What is the *normal convalescent requirement* in any community? Obviously this varies considerably. However, Dr. E. H. L. Corwin estimates for cities 10 per cent of the hospital beds in wards plus another 5 per cent for patients referred by dispensaries, physicians and charitable organizations. Dr, Frederic Brush recommends provision for the equivalent of 12 per cent of the annual general hospital discharges. In connection with the Toronto survey directed by Miss L. Gamble, records kept for some time of all ward discharges revealed that 12 per cent were certified as needing convalescent care.

THE PROVISION FOR CONVALESCENTS IN CANADA

The provision of properly equipped convalescent homes or hospitals in Canada is woefully inadequate. According to the latest compilation of the Dominion Bureau of Statistics, there are only twenty convalescent hospitals, with a combined capacity of but 519 beds. Toronto, with some 177 beds, and Montreal, with some 170 beds, seem to be best equipped. Winnipeg has a 50-bed unit and smaller ones are located in Vancouver, Victoria, New Westminster, Ottawa and other centres. In many large cities there is no record of any convalescent provision whatsoever. Some of these twenty hospitals are but small nursing homes. Not included in this list is the excellent *Deer Lodge* at Winnipeg which is maintained for convalescent ex-soldiers by the Department of Pensions and National Health. Of 205 beds capacity, it is considered to be one of the finest and best equipped convalescent hospitals on the continent. Of course, there are many small "rest homes" and "resorts", but these seldom provide facilities for medical or nursing supervision. Mention should be made also of the well-known institutions maintained at Banff, Radium Springs, Preston, St. Catharines, and other mineral springs.

THE LEADING CONVALESCENT HOSPITALS

Let us consider briefly a few of the better known convalescent hospitals.

The Burke Foundation.—No student of convalescent care on this continent proceeds far in his study before he becomes interested in the Burke Foundation at White Plains, N.J., endowed by the late John Masterson Burke. Opened in 1915 on a sixty-acre site, there are now some thirteen main buildings with a capacity for over 300 adults. A carefully prepared schedule of activity and rest is maintained for the patients; gradually increasing outdoor activity is encouraged and occupational therapy has been an important development. A central Admitting Department with bedrooms, is maintained in the city, where also convalescents are "aided through to reasonable occupational and social re-adjustments."

Thistletown Branch, Hospital for Sick Children.—This convalescent hospital, situated a few miles from Toronto, is Canada's largest and best equipped civilian unit. With beautiful buildings, situated on a large acreage of rolling and wooded meadowland, it has a present capacity of 112 beds. Operated by the Hospital for Sick Children, it has proved of inestimable value to the little patients, and has permitted the city institution to function entirely as an active treatment hospital. Last year at Thistletown the total patient-day's stay was 37,332, the patients being transported twice a week by ambulance. A bus service is maintained to the car line and a truck transports supplies.

The Montreal Convalescent Home.—This hospital has been operated for the past twenty years by a committee of public-spirited women who are assisted by an advisory board upon which sit representatives of the leading English-speaking hospitals. Most of the patients are admitted through the Social Service Departments of the hospitals, although non-hospital cases are admitted. In the event of relapse, the hospitals will readmit the patient. The hospital now maintains a 33-bed home, operated by a staff of four nurses with six others. Arrangements are now being made to erect a beautiful new building, the Lindsay Convalescent Hospital, of 100 beds, of which 65 to 80 will be public and 20 to 35 private and semi-private. Nine acres of land on the outskirts of the city have been secured and it is planned to make full use of physio- and recreational therapy in the new institution.

Hillcrest Convalescent Home, Toronto.—This hospital also is under the direction of a public-spirited committee. At present there is accommodation for 31 women, of whom 14 are public patients. The Study Committee is now considering the possibility of enlarging this institution, either on the present or on a rural site.

The Convalescent Hospital of Winnipeg provides some 50 beds for convalescents. Most of the patients are referred from the Winnipeg General Hospital.

THE TYPE OF UNIT AND SERVICE REQUIRED

The *accommodation* provided should be largely private or semi-private two-bed rooms; no ward should exceed four beds, for rest is essential. The building should be fire-proof and should not be more than two stories in height.

Units of not more than 50 or 60 beds are recommended. As these patients are not bed-ridden, it is essential to provide ample sitting rooms and solaria. Sun porches on each floor, and, perhaps, on the roof, should be provided, and it is important in this climate that they have a southern exposure and be sheltered from prevailing winds, so as to permit use (including sun bathing) in the late fall and early spring.

Recreational facilities are highly desirable. Grounds should be ample. Woodland walks, a small golf course, archery, bowling, tennis and other outdoor facilities should be developed, and indoor provisions should include a library, card tables, music, a lantern, a movie projector and, if possible, a room, perhaps the dining room, which could be converted into an assembly hall. Much could be learned in this respect from our better equipped tuberculosis sanatoria.

The larger convalescent hospitals find an *occupational therapist* of great assistance. Ultraviolet therapy is extensively employed, but few convalescent homes have adequately equipped physiotherapy departments. Massage, electrotherapy, hydrotherapy, and selected or graded exercises, etc., can be of great benefit in restoring the convalescent to full health. The development of such facilities under proper supervision should be the object of every convalescent hospital.

Properly qualified *nursing care* should be provided—a feature which has been neglected in many of the smaller homes. The type of nursing required depends to a large extent upon the type of patient admitted and upon the treatment made available. However, to quote a recent report of the Burke Foundation, "good convalescent treatment is found to be made up of about 50 per cent inspirational human management, 40 per cent housekeeping, and only 10 per cent of nursing. Hence the low ratio of graduate nurses to attendants and leaders of various grades". In that institution there is one employee to three patients. In the Thistletown unit of the Sick Children's Hospital, for 112 patients there are 49 personnel, of whom 9 are graduate nurses, 3 of these being supervisors.

Medical supervision is most important. There should be a medical committee or board to direct the professional work; this may be representative of the various general hospitals interested or be appointed by the board of management. If the hospital be large enough, a resident may be employed; in some institutions junior members of the staffs of city hospitals have a rotating responsibility.

The admission system.—To reach the most needy cases and to avoid delays and confusion in transferring patients, it is highly desirable that an efficient admission system be organized. This is particularly essential where several general hospitals and outside physicians are privileged to utilize the convalescent services.

THE RELATIVE COST OF CONSTRUCTION AND MAINTENANCE

Economy in construction is possible, largely because it is possible to eliminate or reduce in extent costly operating rooms, roentgen and pathological laboratories, the outpatient department, and other services, but buildings should be fireproof. Private rooms cost more than public wards; recreational facilities must be developed; kitchens and boiler rooms are necessary; the nurses and other staff must be adequately housed; and a fair acreage must be purchased at golf club prices. Several excellent convalescent hospitals have been built for about $3,000 per bed, when costs were higher than at present. The Montreal Convalescent Home Committee hopes to build a 103-bed unit for $210,000, equipment being extra. The Thistletown unit cost approximately $650,000, but it should be noted that this 112-bed hospital has a power plant, kitchen, etc., capable of handling three times as many patients.

As for maintenance costs, these also must not be too lightly considered. Buildings must be heated and lighted; floors must be cleaned; linen must be washed; food must be purchased and served; special diets must be prepared and physiotherapy given. If erected apart from the grounds of an existing general hospital, a superintendent must be engaged, also nursing and maid personnel, a dietitian, and a boiler room, kitchen and laundry staff.

From the viewpoint of economy, the convalescent unit operated as a wing or annex of a general hospital would be the cheapest to operate. This was the original French plan and has been followed in London, Chicago and elsewhere. The Kingston General Hospital accepts convalescents in the hospital proper at reasonable rates. The economy in administration and operation and the better oversight are obvious. However, the convalescent himself usually prefers to be out in the country where there is an abundance of sunshine and fresh air. The problem is to so reduce the overhead expense that municipalities and hospital and other organizations will feel justified in erecting such highly desirable homes.

The actual cost of operating convalescent hospitals is difficult to estimate. The figures per patient-day for a number of well-known institutions are given as follows:—

Convalescent Hospital of Winnipeg (1931)	$1.00
Montreal Convalescent Home (1930)	1.43
Hillcrest Convalescent Home, Toronto (1931) ...	1.50
Burke Foundation, White Plains, N.J. (1930-31)	1.81
Grove House, Evanston, Ill.	1.97
St. Luke's Hospital (New York) Convalescent Unit at Greenwich, Conn. (1930)	4.17

The per diem cost at Thistletown is not separately calculated but is approximately two-thirds of the cost of the Toronto unit of the Hospital for Sick Children.

These figures illustrate the difficulty of drawing general conclusions. Averages of available figures indicate that the cost per day is in the neighbourhood of not more than two dollars, but it should be borne in mind that such general statistics include many privately operated homes that provide little more than food and shelter, and offer practically no nursing service. Also there is as yet no generally accepted standard concerning what types of patient should be admitted. Many drastically limit their clientèle, accepting no patients who are bed-ridden or who require dressings or special diets; provide no laboratories, no medical supervision, no physiotherapy nor hydrotherapy departments, no dietitian, no orderly service, etc. To adequately meet the needs of the sick public, the service rendered by the convalescent home should not be too limited—and this costs money. As Dr. E. H. L. Corwin has stated, "When the convalescent homes approach more nearly the modern standards of convalescent care than the majority of them do at present the cost will increase."

Another point frequently overlooked when one speaks of releasing general hospital beds maintained at a high cost per patient-day is that such patient-day cost would be still higher were those general hospital beds now occupied by convalescent patients to be filled by acute cases requiring costly care and diagnosis, thus neutralizing to some extent the economies to be affected by establishing convalescent units.

APPLICATION TO LOCAL COMMUNITY NEEDS

In the final analysis one is particularly interested as a rule in the introduction or development of such care in one's own community. And here the problem is often quite different from that encountered in cities with millions of inhabitants. It is generally agreed that the need for convalescent beds is in direct ratio to the size of the community. This is perfectly obvious when one considers, in large centres, the increased ratio of apartment dwellers, the decreased number of private lawns and sun porches, the less intimate contact with the neighbouring countryside, and the greater proportion of impecunious patients living away from the family home. For this reason a survey of the community needs should be an essential preliminary step.

This survey could be made by arranging with the nursing and medical staffs of the local hospitals to note on a special form whether or not patients discharged from these hospitals over a given period of time require convalescent care such as could be supplied by a convalescent hospital. This has been carried out in the present Toronto survey with most interesting results. To these data should be added also the percentage of patients being treated at home or in dispensaries, if any, who would benefit by such provision. These data could be obtained only with the cooperation of the local doctors, and therefore it would be advisable to discuss the matter with the local medical society and arrange for the cooperation of each practitioner.

Separate or united institutions? — In larger centres with several hospitals the question must be faced, "Should each large hospital have its own convalescent institution, or should all combine to support one convalescent hospital?" A choice must be made between the impetus and enthusiasm associated with the limiting of support to one hospital group and the increased economy and efficiency of a larger institution under unified direction. As an instance of economy, with comparatively little additional expense the 112-bed Thistletown unit could be operated as a 350-bed plant. Moreover, the ratio of personnel to patients falls with an increase in size. For these reasons, with the probable exception of tuberculosis and pædiatric units, one combined institution would seem more desirable than an array of separate ones scattered over the countryside.

From the viewpoint of medical oversight and follow-up care it might be advisable to keep convalescent patients from certain hospitals together for study purposes. For this reason some who favour combined support recommend that each of the major hospitals supplying patients be responsible for a separate wing or unit. It is suggested that such an arrangement, besides permitting a better follow-up, would permit joint use of the physiotherapy, baths and other therapeutic facilities, would reduce administrative and operative overhead, and stimulate friendly rivalry between groups. However, this arrangement does not permit the segregation of types of patients, for instance, cardiac or orthopædic patients, into groups. This latter would be the more desirable arrangement, provided the enthusiastic participation and support of the various hospitals and their medical staffs could be assured.

Finally, but by no means the last feature to be studied, there should be a consideration of the likely sources of revenue. As patients most needing convalescent care are least able to pay, patient-revenues alone are insufficient. Other and supplementary sources of income are municipal contributions, provincial grants in some cases, general hospital or social service organization appropriations, and private gifts and endowments. Generous municipal contributions to both construction and maintenance should be encouraged. Until the electorate realizes this

obligation, private philanthropy must lead the way and, in many communities, there is here offered a most worthy opportunity for wealthy and altruistically minded individuals to earn the lasting gratitude of their less fortunate fellow-citizens.

REFERENCES

1. CORWIN AND KIDNER, Standards for Convalescent Homes, Burke Foundation, New York, 1930.
2. Institutional Convalescence. A Report of the Public Health Committee of the New York Academy of Medicine.
3. BRUSH, Recreational Therapy in Convalescence, Sturgis Fund of the Burke Foundation.
4. STONE, Hospital Organization and Management, Faber and Gwyer, Ltd., London, 1927, pp. 32, 60, 268-270.
5. LEWINSKI-CORWIN, *Bull. Am. Hosp. Ass.*, 1929, III: 4, pp. 193-201.
   Institutional Convalescence. Miscellaneous Constributions Number One. The Committee on the Costs of Medical Care, Washington, D.C., 1930.

THE FELLOWSHIP OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

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"To the making of many books there is no end"; the same might be said of the making of diplomas. As, however, there are books and books—the *biblia abiblia* of Charles Lamb—so there are diplomas and diplomas. Among diplomas it is safe to say that none stands higher than that of Fellow of the Royal College of Surgeons of England, which for many years has held an unrivalled position among the surgical diplomas or degrees of Great Britain. The possession of it is now regarded as practically obligatory for membership in the honorary staff of all the hospitals connected with the medical faculties of the English universities. It may be of interest to learn how the diploma came into existence and how it may be obtained; but first a few words about the Royal College itself.

Although the Charter of the College only dates from 1800, it descends from an earlier Charter granted by Edward IV as far back as 1462 to the Freemen of the Mystery of Barbers in the City of London, practising Surgery. Before the date of this earlier Charter there were two Guilds exercising authority in London in matters relating to the practice of surgery—the Barbers' Guild, of which we first hear in 1308, and a rival Surgeons' Guild, mentioned in the City Records of the year 1369. By a Charter of Henry VIII the two Guilds became united, an open and visible sign of the union being the joint occupancy of Barbers' Hall which still stands on its old fifteenth century site in Monkwell Street. The union, never we may imagine a very happy one, was dissolved in 1745, the surgeons findings a new home in Surgeons' Hall in the Old Bailey, entering into possession in 1751.

The grant of the Charter of 1800, to which reference has previously been made, whereby the name of the Royal College of Surgeons in London was first authorized, was probably hastened by the Company of Surgeons, which had recently acquired a freehold site in Lincoln's Inn Fields, being entrusted with the care of the Hunterian Collection of museum specimens.

In 1843 still another Charter was granted whereby the name of the College was changed to that of the Royal College of Surgeons of England and a new class of Members was instituted who were to be known as Fellows, from and by whom the Council was to be elected. "The first Fellows, three hundred in number, were chosen mainly from the surgeons, assistant surgeons, and lecturers of the metropolitan and provincial hospitals. They were elected under one general diploma on December 11, 1843. A further election of two hundred and forty-two Fellows took place on the 26th of August, 1844, and these included a considerable number of representatives of the naval, military and Indian forces".*

The first examination for the diploma of Fellow was held in December, 1844. It lasted two days, the first day being devoted to the subject of Anatomy and Physiology, the second to those of Pathology, Therapeutics and Surgery. The examination in Anatomy and Physiology was made a separate examination with the distinguishing title of "the Primary Examination" under a by-law passed in 1874. The first Primary Examination under these new conditions took place in May, 1876. At the present time there are between 2,000 and 2,100 Fellows.

The Primary and Final Examinations are each held twice a year in London, the Primary in the early part of June and December, the Final in the later part of May and November. In 1929 a Primary Examination was held in Toronto; in 1930 in Montreal; in 1931 in Melbourne and Toronto, these being the only occasions on which the examination has been so far held outside London.

Although at the Primary Examination the candidate may be asked questions on any subject which may be fairly regarded as lying within the broad fields of Anatomy, including embryology, and of Physiology, including histology and biochemistry, special attention is given to such matters as have an important bearing on the surgeon's art. The examination consists of written and oral portions, there

* The above statement is taken from a historical summary in the calendar of the College, a summary to which I am generally much beholden.

being four questions in the Anatomy paper, all of which must be answered, and six questions in the Physiology paper, of which four only are to be answered. The questions set at past examinations are published by Taylor and Francis, Red Lion Court, Fleet Street, London E.C.4, from whom they are obtainable for a small sum. The oral portion of the examination extends over a period of forty minutes, twenty minutes being devoted to each of the two subjects. Although there are no fixed rules as to how this portion of the examination shall be conducted, it is a common practice to spend a considerable part of the time available in Anatomy on Osteology, and in Physiology on Histology. In Anatomy the condidate is examined in addition upon dissected bodies, upon dissected parts on trays or in bottles, and upon the living model; in Physiology upon such matters as the chemical composition of various body fluids, upon the use of various physiological instruments, and upon tracings of the movements occurring in the circulatory and respiratory systems. I would add that occasionally questions are asked in both the written and oral portions of the anatomy examination on morphology, should a knowledge of them serve to explain some embryological condition or illustrate some biological principle. The standard of knowledge required from the candidate is high; only something like 30 per cent of the candidates who present themselves for examination are usually successful. On the other hand, the examination is one in which a candidate who is well prepared has an excellent prospect of passing, provided he retains his composure. As to preparation for the examination there is no better way than by acting as a student demonstrator in one or other subject or still better in both, an experience which should ensure not only a sound practical knowledge of the subjects but also engender that sense of confidence so essential for success in all examinations. In the absence of such opportunities, the candidate should spend as much time as possible with forceps and scalpel in the dissecting room and with test tubes and reagents in the physiological laboratory.

The Final Examination has never been held away from London nor is it likely that it ever will be. The subject of examination is Surgery in all its branches—surgical anatomy, surgical pathology, operative surgery. The best preparation for this examination, a preparation which practically speaking is essential, is to have acted as a house surgeon under able and experienced general surgeons.

While no doubt a student who wishes to obtain the diploma will have to engage himself deeply in the study of the subjects of the examination he may be promised much pleasure in his pursuit of knowledge as well as a reasonable prospect of ultimate success. No diploma carries with it more honour or distinction, an opinion fully confirmed by the increasing number of candidates presenting themselves for it, candidates gathered from all quarters of the Empire.

Men and Books

THE MEDICAL HISTORY OF BRITISH COLUMBIA*

BY A. S. MONRO, M.D.,
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THE PERIOD OF MODERN TRANSPORTATION AND INDUSTRIAL DEVELOPMENT, 1880 TO 1910

In 1870, just before the entrance of British Columbia into Confederation, a census of the province was taken and the white population was found to be less than 10,000—to be exact, 9,100, and the number of practising physicians was less than 10 (7 or 8 at the most). The prospect of obtaining rail communication with eastern Canada was not very bright, and many gloomy forebodings were expressed both by the people of British Columbia and eastern Canada when the matter became the subject of negotiation between the representatives of the Colony and the Government at Ottawa. However, in spite of all the real and seeming difficulties of carrying out this great national enterprize, a satisfactory agreement was reached and embodied in the Terms of Union which were signed at Ottawa and later ratified by popular vote in British Columbia.

Realizing that a most complete exploration and examination of all the known roads from the Pacific to the Rocky Mountains was necessary before a final decision could be made and contracts let, the Dominion Government in 1872 commenced an intensive survey that continued for nearly eight years. Late in the autumn of 1879, having adopted the line through the Yellow Head Pass to Burrard Inlet (the present C.N.R. route), via the North Thompson River, Kamloops, Lytton and Yale to Burrard Inlet, it determined to build at once from Emory's Bar (4 miles west of Yale) on the Fraser to Savona at the outlet of Kamloops Lake, a distance of

* Previous instalments of this article can be found in the *Journal*, 1931, **25:** 336 and 470; 1932, **26:** 88, 225 and 345.

128 miles. Tenders were called for its construction in four sections. The first two were awarded to eastern Canadian contractors who sold out to Mr. Andrew Onderdonk to whom were awarded direct the last two sections. The whole work thus came under the latter's direction.

Mr. Onderdonk was a young engineer of marked ability who had been successful in sundry contracts in California, and he was backed financially by Mr. D. O. Mills, multimillionaire, of California, so that he had unlimited means at his disposal—a most fortunate circumstance for all concerned as the difficulty of obtaining supplies was very great and a poor man would have been greatly handicapped.

Shortly after the work of construction from Emory to Savona had been begun in 1880 a syndicate was formed to organize a company to build the Canadian Pacific Railway as a whole, and as part of the subsidy to that company the Government undertook to build the line from Port Moody to Savona, 212 miles, and hand it over to the Company. By January, 1885, Mr. Onderdonk had completed the line between these two points.

The "extension" of the line from Port Moody to Granville (now Vancouver) was arranged during a visit of Sir William Van Horne in the winter of 1884-85. For this the Canadian Pacific Railway received a subsidy from the Provincial Government of 6,275 acres, the tract extending from Burrard Inlet to the Fraser River. However, since the use of the word "extension" was found to be illegal, as by the Dominion Act Port Moody had been specified as the terminus, the difficulty was circumvented by describing it as a "branch" of the main line and Port Moody remains to this day as the statutory terminus of the Canadian Pacific Railway.

When the Canadian Pacific Railway was organized in 1880, they pushed the work from Winnipeg westward with all possible energy and appointed General Rosser chief engineer. He came to the conclusion that many advantages would be gained by adopting the Kicking Horse Pass as the one through which the railroad should be carried, instead of the Yellowhead Pass which had been chosen by the Government.

In March, 1881, General Rosser determined to explore the Selkirks and ascertain if a pass could be found through them which would cut off the Big Bend of the Columbia, and detailed Major Rogers, a man of indomitable courage and experience in this line of work, to explore the possibilities of this route. After two years of strenuous work, Major Rogers reported favourably on the valley known as Rogers' Pass (the site of the present five-mile Connaught Tunnel), and the line was carried through the Rockies and Selkirks, via Kicking Horse and Rogers' Passes, instead of by the Yellowhead Pass.

In the spring of 1884 the Company made arrangements with Mr. Onderdonk to continue the construction from the end of the government work at Savona eastward to Griffin Lake, where it was expected he would connect with the party (of James Ross, contractor, of Montreal) which was building westward from Calgary. By October, 1885, he had completed track-laying to Craigellachie, sixteen miles east of Shuswap Lake (Sicamous Junction) and three hundred and thirty-nine miles from Port Moody, but could not continue farther westward as the work done had exhausted all the rails that had been shipped by water to the Pacific coast. On November 7, 1885, the track from the east reached Craigellachie and was linked to that from the west, thus completing the transcontinental line from ocean to ocean —a consummation which had been looked forward to with hope from the time of Dominion Confederation in 1867.

When construction commenced on the Onderdonk contract, 1880, the medical work was placed in charge of Dr. E. B. C. Hanington, who had previously been practising in Victoria. As the work progressed, Dr. S. J. Tunstall, who had recently arrived (1881), in the province from Montreal, was added to the medical staff and was in charge of the work, first, at Lytton where he spent two years, and, later, at Kamloops. Dr. Charles Hanvey was also on the staff about this time and, when he resigned, was succeeded in June, 1884, by Dr. M. S. Wade, who joined the staff as assistant surgeon to take charge of the medical work at Spence's Bridge, then "at the end of the track". Telling about this later, Dr. Wade wrote.

> First Dr. S. J. Tunstall had charge of the work that was to be mine, and when he removed from Lytton to Kamloops, where he remained until he went down to Vancouver to practise, he was succeeded by Dr. Hanvey, and I succeeded Hanvey. I had been in a few frontier towns before that—Winnipeg, Moosejaw, Regina on the prairies, others across the line, and later saw mining towns—but they were all calm, peaceful Sunday school towns as compared with wicked, spritely, noisy, gold-lined Yale. It was a wide-open town. Faro, roulette, poker, écarté, stud—every conceivable game provided for the one purpose of separating greenbacks and dollars from the pockets of the railway workers—could be indulged in morning, noon and night, weekday or Sunday. Every pay-day saw another gory coat added to the flaming colour of the little Gehenna that sits so modestly at the feet of Yale Mountain, and past which murmurs and prattles in all innocence the bubbling creek bringing its ice-cold waters from the silver-streaked hills behind.

In 1884, Dr. H. E. Langis, for many years one of the prominent pioneer medical practitioners of Vancouver, arrived in the province. In April, 1885, he succeeded Dr. Hanington, who had retired from the work to resume practice in Victoria. Dr. Langis, who now resides at Parksville, Vancouver Island, enjoying a well

earned retirement, writes of his railway medical experiences as follows.

> In April, 1885, I took Hanington's place and had for field of duty from Port Moody to Savona. We had a small hospital (12 beds) at Yale, with very little apparatus and had to furnish our own surgical instruments. The accommodation was very scant and, when we had to perform under anæsthetics, the only anæsthetist available was the steward and head nurse and, at my time, only nurse, who would administer chloroform under the vigilant eye of the performer. Anyhow, we had very few mishaps and bad results, as the contractors, in blasting, would kill their men outright and do very little injury to those that fell under our care. In the fall of 1885 we all came to Granville, which a few months afterwards was going to be Vancouver. S. J. Tunstall remained in Kamloops and, if I remember well, came to Vancouver only in 1891 or 1892.

None of the aforementioned medical men are now living except Dr. Langis and Dr. Chas. Hanvey, and it was only by chance that the writer, in the summer of 1931, in discussing the work of the Onderdonk contract with Mr. Thomas White, C.E., now retired, learned that Dr. Hanvey was still living in California and had visited Vancouver only a year or so ago. No doubt there were other medical men engaged on this work during the period 1880 to 1885, probably in a temporary capacity, but the available records are silent regarding them.

DR. ERNEST BARRON CHANDLER HANINGTON (1851 TO 1916)

Dr. Hanington was born at Shediac, N.B., on January 20, 1851. He studied medicine at McGill and graduated from that University in 1875. He was the first superintendent of the St. John General Hospital. In 1878 he married Miss Ida Tilley Peters, of St. John, and in the same year came to Victoria, B.C., where he at once engaged in general practice.

In 1880 Dr. Hanington was appointed chief surgeon at Yale during the Canadian Pacific Railway construction and had charge of medical work from Port Moody to Savona. On completion of the line (1885), he returned to Victoria, to resume private practice in that city, and continued in active work until the time of his death, in May, 1916.

DR. SIMON J. TUNSTALL (1852 TO 1917)

A native of Quebec, Doctor Tunstall was born at St. Anne de Bellevue on September 19, 1852, a son of Gabriel Christie and Jessie (Fraser) Tunstall, both of whom, natives of Montreal, were descendents from pioneer families, identified with the early history of the province. Through General Christie, Dr. Tunstall was Co-Seigneur of Lacolle and de Beaujeu. On the maternal side his great-grandfathers were Major Fraser, who, as an officer of the Fraser Highlanders, was present at the capture of Quebec under Wolfe, and Donald McKay, United Empire Loyalist. Simon Fraser, a famous "Nor'Wester," discoverer of the Fraser River, was a grandfather on the maternal side.

Dr. Tunstall received his education in Montreal. After attending the High School, where he won the Davidson gold medal, he received his arts degree, 1873, and in 1875, the degrees of M.D., C.M., being Holmes' medallist in his graduating year. Locating at Papineauville, Que., he practised there for four years and then a year at Montreal before coming to British Columbia in 1881 to associate himself with Dr. E. B. C. Hanington, a classmate at McGill, who had undertaken the medical work under the Onderdonk contract.

Following completion of the Canadian Pacific Railway in 1886, we find Dr. Tunstall established at Kamloops, where he filled the position of Canadian Pacific Railway surgeon and also engaged in general private practice. He was also medical officer to the Royal Inland Hospital. In 1892 he removed to Vancouver and soon established for himself a fine general practice which he carried on until a year or two before his death.

Dr. Tunstall was a member of the British Columbia Medical Council, 1886, and later served as President of the College of Physicians and Surgeons of British Columbia. He was a Past-president of the Canadian Medical Association, presiding at the 1904 meeting in Vancouver, that being the first occasion when the National Association met in British Columbia. His activities in hospital work embraced both the professional and lay fields. He was one of the incorporators of the Vancouver General Hospital, as well as a director of that institution for a number of years. He occupied a prominent place on the medical staff up to the time of his retirement from practice in 1912. Following an extended visit to Europe before the war, he returned to Vancouver where he passed away in 1917.

DR. MARK S. WADE (1858 TO 1929)

The writer had the privilege of practising in the same community with Dr. Wade from 1896 to 1898. As a medical man he possessed those qualities of sound judgment and professional ability, combined with an innate sympathy and courtesy towards his patients, which endeared him to all those with whom he came in contact.

At the time of his death the press, both in Kamloops, his home city, and in Vancouver, bore eloquent testimony to his outstanding qualities displayed in varied fields over a period of more than forty years.

We read:

> Dr. Mark S. Wade, police magistrate and historian, passed away April 19, 1929, in the Royal Inland Hospital, Kamloops, after a short illness, in his 71st year. Dr. Wade died in harness, having sat on the Bench on

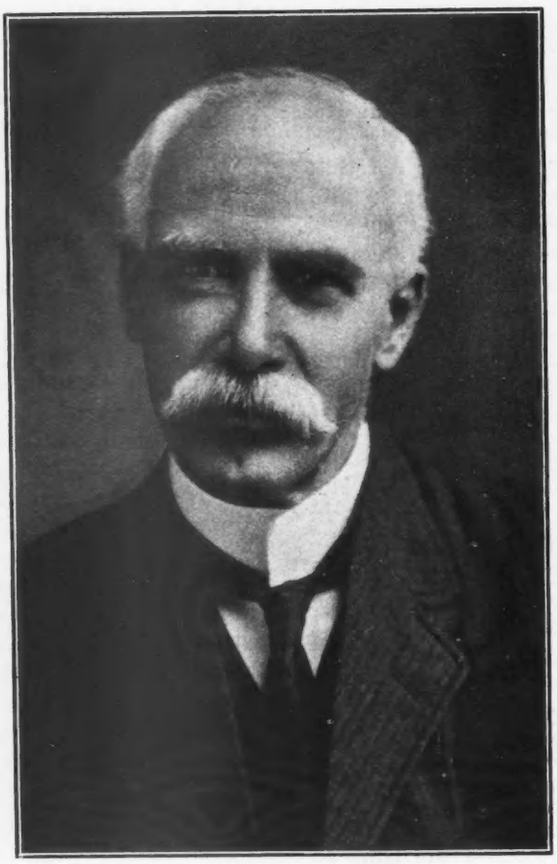
Friday morning last. He went from there to the hospital, where an operation was performed, but apparently he was holding his own until yesterday. He went through a serious operation four years ago, and made a complete recovery.

Born in Sunderland, Durham, England, November 23, 1858, Dr. Wade studied medicine in Glasgow, and was an M.D. of Fort Wayne Medical College, 1882, and M.D., University of California, 1889. He came to British Columbia in 1883, and, being ahead of the railway, to use his own words, qualified as an old-timer. He practised in New Westminster, 1883-1884; was an assistant surgeon, Canadian Pacific Railway from 1884 to 1885; practised in Clinton, 1885-1889; Victoria, 1889-1895; Kamloops, 1895-1904; editor, *Inland Sentinel*, 1904-1912.

The late Dr. Wade was in great demand as a public speaker. He was founder and President of the Kamloops branch of the Canadian Historical Association. A few years ago he made a lecture tour of the Province and was everywhere feted.

Dr. Wade was author of "The Thompson Country," "History of Kamloops and District," "Tales of the Cariboo Road," which first appeared in the *Daily Province* about eight years ago, and many articles and pamphlets, besides his magnum opus. "Mackenzie of Canada," published in the fall of last year.

For ten years the doctor has acted as police court magistrate in Kamloops, where his administration of justice was sound and fearless. An enthusiastic gardener, his activities in this direction were only equalled by those of his wife. Born in Victoria, she was formerly Miss Emma Uren, daughter of the late James B. Uren, of Savona, and sister of Mrs. J. B. Leighton, a well-known pioneer of Kamloops. Their son Leighton is general superintendent of the East Kootenay Power Company.



Dr. M. S. Wade

Following is an appreciation by the editor of the *Vancouver Province:*

The late Dr. Mark S. Wade of Kamloops, gave British Columbia triple service in his day. He was a pioneer physician; he interested himself in compiling and preserving the history of the province; and he served for a decade as police magistrate, dispensing sound and fearless justice . . .

When Dr. Wade was a country doctor he operated in a country that was particularly difficult. It was sparsely settled; there were no other doctors within scores or hundreds of miles; roads were few and often very bad, and usually a faithful horse was the only means of transportation. Ministering to the medical needs of his district not infrequently entailed tremendous hardships, but Dr. Wade was not the man to shirk the duty. He knew the pioneer and his troubles and the shifts he had to make, he honoured him for his courage and his fortitude, and did what he could to make his hard lot easier.

Peraps it was his respect for the pioneer that roused Dr. Wade's interest in the very first pioneers of British Columbia, the old fur traders of Astoria and North West Company and Hudson's Bay Company days, and the argonauts of gold-rush times, many of whom were still active in the province when he arrived. Whatever the reason for it, Dr. Wade's interest in the early history of British Columbia was deep and abiding. He collected records and stories; he investigated, and his familiarity with the country enabled him to check and compare and reject the dross. The fruits of his study he gave to the public in lectures and articles and in two or three books. A dozen years ago British Columbia had three pioneer physicians all interested in and writing about the early history of the province, Dr. Wade, Dr. W. W. Walkem, of Vancouver, and Dr. C. F. Newcombe, of Victoria. All are gone now. Dr. Wade was the last of the very interesting and notable trio.

The work of carrying the line through from the eastern approach to the Rockies, westward, was in the hands of the railway company. The North American Construction Company, a subsidiary, had direct charge of the work. Its superintendent was the late Mr. James Ross, of Montreal, who was assisted by Mr. Herbert Holt (now Sir Herbert Holt), of Montreal. The medical work was in charge of Doctors Orton and Brett, both then practising in Winnipeg. Dr. Orton was a member of the Federal House, and to Dr. Brett, unhampered by parliamentary duties, fell largely the task of supervising and carrying on the medical work of the contract, on which were employed some ten to twelve thousand men.

In September 1931, the writer had the privilege of meeting at Banff, Alta., two brothers, G. M. and W. H. Fear, now in their "mid-seventies," who had followed the Canadian Pacific Railway in its progress westward from Winnipeg to the Selkirks. From these gentlemen the following facts were gleaned.

In 1883 construction and medical headquarters were at Holt City — also known as Silver City—and, later, after the completion of the line, called Laggan, and now the station known as Lake Louise. Here a small hospital was located in charge of Dr. R. G. Brett, who was assisted for a time by his brother, Dr. William Brett, who died there. Dr. J. A. Sweat, who had been in the mounted police, was also

on Dr. Brett's staff and, later, when the line was completed, we find him located at Donald in 1886, where he continued for a year or so. Dr. Wood was also on the staff at that time.

The most prevalent disease among the workers was "Rocky Mountain fever", or what was known in Winnipeg in those days as "Red River fever", and this disease was the cause of not a few deaths.

Blasting operations were carried out with the use of black powder and dynamite and accidents from the use of these explosives, while often resulting in the immediate death of the victims, did not cause nearly as great a mortality as that resulting from fever. Just down the mountain side from what was then known as Tunnel City, now Field, B.C., near the entrance to the Mount Stephen tunnel, may yet be seen the disused cemetery in which these were buried. As the work progressed the headquarters were moved in 1884 to Beavermouth, and 1885 to Revelstoke (then known as Farwell).

In a personal communication to the writer, under date of October 6, 1931, from Mr. J. E. Griffith, Deputy Minister and Chief Engineer of Railways, in the Department of Railways at Victoria, the following additional names of medical men on Dr. Brett's staff, between Banff and Revelstoke, are mentioned: Dr. Grier; Dr. Moore; Dr. W. J. McGuigan (later mayor of Vancouver, now dead); Dr. O. I. Grain,* and Dr. Milroy.†

Mr. Griffith adds: "The above information was given me by Mrs. Haldane, a daughter of the late Dr. George Turner Orton. She and her mother are now residing in Victoria; they both spent the summer of 1884 in the mountains.

"As to Dr. Sweat, it was my impression that he was in private practice during a portion of the construction, and Mrs. Haldane is inclined to be of the same opinion. He was, however, in the employ of the Canadian Pacific Railway when we were constructing the snowsheds in 1886. He was an American citizen and left for the States in 1887.

"I started with the Canadian Pacific Railway in the spring of 1881, when the end of track was practically at Winnipeg. We had very little sickness on the prairie and few accidents until we got into the mountains. I only remember one case of smallpox on the Prairie. One of the engineers had been to Winnipeg on business and stayed in my camp. On his return he complained of being sick, but we thought the rash was measles, but a few days later when a doctor arrived he pronounced it smallpox. In course of time we got a new outfit and burned everything in camp. Fortunately no one else developed it.

"Conditions were different in the mountains, the work being so much heavier; the number of men employed in every construction camp was much larger, the space for camp sites very often limited, and sanitary measures, to say the least, very primitive. Moreover as camp remained in the same spot very much longer than on the prairie it naturally made conditions much worse, and, although many of the camps had their water from small streams running into the main rivers, such as the Kicking Horse, Beaver, Columbia and Illecillewaet, out on the work the men would be mostly drinking from the main rivers. Hence when 'Mountain Fever' became fashionable, it was reasonable that all the main rivers became polluted and men became sick, even in new camps down stream. As we never heard of mountain fever after construction was finished, it was a safe bet that it was really typhoid. There was also quite a lot of scurvy.

"As we were always ahead of the end of the track we were not in touch with any hospitals and very seldom saw a doctor. We always camped as far as possible from any construction camp, and were only concerned with the actual work, so that I am unable to give you any reliable information regarding mortality and where the dead were buried. I have no reason to think that the number of deaths on the Canadian Pacific Railway construction was anything near as large as reported on the other transcontinental railways to the south. As far as the engineers were concerned, I can only remember four deaths. I was only sick once, that was just before Christmas, 1884, at camp between Donald and Rogers' Pass. It passed, at the time, as inflammation of the bowels. Dr. Brett arrived about a week later and ordered me out, placing me in a freighting sleigh with lots of hay in the bottom; nice clear weather, but 40 degrees below zero. Unfortunately, the sleigh turned over on a narrow tote road in the Beaver Canyon. The three men jumped clear, and when the sleigh turned over I was jammed in the hay across a stump, but the horses continued down into the river. They soon got me up the tote road, while I had to lie in the snow for an hour before they could get another sleigh to take me to the end of track at Beavermouth. I was troubled with occasional cramps for about a year afterwards. A long time afterwards Dr. Brett told me that it was appendicitis, and if they had known as much about it at the time they would have operated. I was certainly in terrible pain, and can't

* Dr. Grain was a nephew of Mr. Griffith's grandfather and died recently in Winnipeg. He was a member of the Federal House for some years, representing Selkirk, Man.

† Died some years ago in Winnipeg.

help but think that if the boys had known what it was they would have been a little more sympathetic; evidently from their point of view a 'tummy-ache' was no worse than toothache. On the other hand, if I had been told the truth it might have frightened me to death!

"*End of track of C.P.R. construction* was as follows.—End of 1880, Winnipeg; end of 1881, Flat Creek, west of Brandon; 1882. Maple Creek; 1883, Silver City (Holt City); 1884, Beavermouth; 1885, Nov. 7, last spike driven at Craigellachie.

"The information given you by the Fear brothers is about correct; they were evidently employed at the end of the track."

DR. ROBERT GEORGE BRETT (1851 TO 1929)

As the time elapsed since the passing of Dr. Brett has been so short and since the November, 1929, issue of the *Canadian Medical Association Journal* contains a most excellent and comprehensive biographical sketch of him, prepared by Dr. G. E. Learmonth of Calgary, together with an appreciation by Mr. J. H. Woods, Editor of the *Calgary Herald*, and a beautiful tribute by the Hon. J. E. Brownlee, Premier of Alberta, it would seem almost a work of supererogation on my part to attempt to add anything to what has already been written. It is always difficult to assess at their proper value qualities that make up the general character of a man whose activities were so varied as were those of Dr. Brett. However, on account of having personal recollections of him covering a period of nearly fifty years, the writer may be pardoned for adding his meagre quota to what has already been said.

My first recollection of Dr. Brett was in November, 1882, when he was called in as a consultant to see my father who was in his last illness, suffering from what was then known as "Red River fever." Although Dr. Brett was a young man and a newcomer to Winnipeg, it was evident that he was looked upon, even then, by the older practitioners as possessing some of those qualities that made him sought after for his opinion and advice.

In the winter of 1893-4, the writer being then a student in the medical school at Winnipeg, Dr. Brett spent a month or six weeks in the dissecting room, reviewing anatomy, preparatory to taking post-graduate work at Vienna. His genial optimistic temperament, friendly spirit, and the keen manner in which he carried out his anatomical investigations, at once made him a favourite with his fellow students. The very fact that a man of his experience and reputation should deem it advisable to take a course in the dissecting room before proceeding to further studies abroad made a deep impression on our youthful minds, and the worth of a thorough knowledge of anatomy as applied to the practice of medicine took on a new value with us all.

The next occasion of our meeting was at Banff in the fall of 1909, when delegates from the four western provinces met there to discuss important questions of medical policy affecting the profession in the west. Dr. Brett, as one of the delegates representing Alberta, and also in his capacity as host to the convention, did much to make the meeting an enjoyable one, and, by his wise counsel, to bring the work of the convention to a satisfactory conclusion.

On the return journey from a trip in the Peace River country, in 1920, the writer again had the pleasure of meeting Dr. Brett—this time at Edmonton, and enjoyed his hospitality at Government House. Although not in active practice at that time, he was always interested in the problems of the profession—and they were not a few. By his active influence, used wherever possible, and his keen political sense, he was an invaluable friend, counsellor and guide to his medical colleagues in Alberta in those years.

Towards the close of his tenure of office as Lieutenant-Governor of Alberta, he suffered a great loss in the sudden death of his only remaining son, Dr. Harry Brett. In 1925, his health, until then rugged and wonderful for a man of his years, commenced to fail. In the fall of 1925 we met in the corridors of the Windsor Hotel, Montreal. He was then on his way to Baltimore to consult his old friend Dr. Lewellys F. Barker. During the succeeding years he wintered in California, enjoying a fair measure of health. On his way through Vancouver each fall his custom was to foregather with a few old friends before leaving for the south, talk over events of the day, spin yarns, at which he was always most interesting, and make a most enjoyable evening of it for all.

During the long life, colourful and full of action, the impressions he made upon those around and associated with him must have been many and varied, and the writer could not conclude this sketch in any better manner than by quoting the words of an old friend, the Rt. Hon. R. B. Bennett, Prime Minister of Canada, who paid this tribute.

"Dr. Brett was one of the last of the great pioneers of the west. He was a leading medical practitioner of Winnipeg. He established Banff as a health resort and enjoyed a wide reputation as a skilful physician, whose sympathetic personality inspired innumerable patients with confidence and hope.

"He was privileged to take no insignificant part in the early political life of the North West Territories and for a brief period was head of the government, but it was as Governor of Alberta for upwards of ten years that his

genius for friendship found its fullest expression and made him not only an ideal host but the popular and beloved representative of the Crown.

"His long and varied career is ended. He will be remembered as a great physician, a devoted public servant, and useful citizen. But his passing is a personal sorrow to many who, like myself, knew him as a steadfast and loyal friend who diffused a spirit of optimism and happiness as he journeyed along life's way. We shall not look upon his like again."

(To be continued)

Association Notes

Preliminary Program for the Sixty-Third Annual Meeting, Canadian Medical Association; and the Fifty-Second Annual Meeting of the Ontario Medical Association.

TO BE HELD IN TORONTO ON JUNE 20th, 21st, 22nd, 23rd and 24th, 1932.

Headquarters—The Royal York Hotel

Registration will commence at 8.30 o'clock on the morning of Monday, June 20th, in the Royal York Hotel, and will continue throughout the week.

The first two days—Monday and Tuesday, June 20th and 21st, will be devoted to the business sessions of the two Associations, while Wednesday, Thursday and Friday will be scientific days.

Monday, June 20th

8.30 a.m.—Meeting of the Executive Committee, Canadian Medical Association, in the Club Room.

10.00 a.m.—Meeting of Council, Canadian Medical Association—Roof Garden.

1.00 p.m.—Luncheon to Council, as guests of the President-Elect, Dr. A. Primrose
Valedictory Address—The President of the Canadian Medical Association, Dr. A. S. Monro, Vancouver.
Installation of the new President.

2.15 p.m.—Meeting of Council—Roof Garden.

5.00 p.m.—Annual Meeting Canadian Medical Protective Association—Roof Garden.

7.00 p.m.—Dinner to Council in the Ball Room —Guests of the Academy of Medicine, Toronto.

Tuesday, June 21st

9.00 a.m.—Meeting of Council, Canadian Medical Association,—Roof Garden.

1.00 p.m.—Luncheon.

2.15 p.m.—Official opening of the commercial exhibits.

2.30 p.m.—Meeting of the Committee on General Purposes of the Ontario Medical Association—Roof Garden.
Golf for those who are free.

6.00 p.m.—Meeting of the Nominating Committee of the Ontario Medical Association.

7.00 p.m.—Dinner to Council in the Ball Room —Guests of the Ontario Medical Association.

(The program will be in charge of the Committee on Inter-Relations of the Ontario Medical Association.)

Wednesday, June 22nd

8.30 a.m.—Registration in Exhibition Hall, Royal York Hotel.

9.15 a.m.—Sectional Meetings, Royal York Hotel.

1.00 p.m.—Luncheon, Royal York Hotel Roof Garden; Guest Speaker, Sir Arthur Currie. Short Business Session.

2.15 p.m.—General Session, Concert Hall, Royal York Hotel.

4.30 p.m.—Garden Party, University Quadrangle, guests of Dr. and Mrs. Primrose.

7.00 p.m.—Annual banquet of the Canadian Medical Women's Association, at the Granite Club.

9.00 p.m.—Osler Oration, delivered by Dr. Francis Packard, Philadelphia.

Thursday, June 23rd

8.30 a.m.—Clinics at the Hospitals.

10.30 a.m.—Sectional Meetings, Royal York Hotel.

1.00 p.m.—Luncheon, Roof Garden, Royal York Hotel; Guest Speaker, Sir Robert Falconer, Toronto.

2.15 p.m.—General Session, Concert Hall, Royal York Hotel.

4.30 p.m.—Garden Party at "Ardwold," guests of Lady Eaton.

7.45 p.m.—Association dinner-dance, Concert Hall and Ball Room, Royal York Hotel.

Friday, June 24th

8.30 a.m.—Clinics at the Hospitals.

10.30 a.m.—Sectional Meetings, Royal York Hotel.

1.00 p.m.—Luncheon, Roof Garden, Royal York Hotel; Guest Speaker, Canon H. J. Cody, Toronto.

2.30 p.m.—General Session.

8.00 p.m.—Public Meeting, Concert Hall, Royal York Hotel; Speakers, The Right Honourable R. B. Bennett, Prime Minister of Canada;

Dr. Geo. Kosmak, New York, on "Maternal Welfare."

Dr. J. H. Mason Knox, Baltimore, on "Infant Welfare."

GENERAL SESSIONS

Place of Meeting—Concert Hall, Royal York Hotel

Wednesday, June 22nd

2.15 p.m.—Tumours of the Bronchi—Dr. J. C. Meakins, Montreal;

The rôle of bronchoscopy in the diagnosis and treatment of pulmonary disease—Dr. R. S. Pentecost, Toronto;

Cancer of the rectum—Dr. Daniel Jones, Boston;

Variabilities in duodenal ulcer—Dr. Donald Balfour, Mayo Clinic, Rochester.

Thursday, June 23rd

2.15 p.m.—Lantern demonstration of ordinary diseases of the fundus of the eye, for the general practitioner—Dr. W. H. Lowry, Toronto;

The relationship of psychiatry to general medicine—Dr. Ralph Noble, New York;

Diaphragmatic hernia—Dr. W. H. Dickson, Toronto.

Friday, June 24th

2.30 p.m.—Symposium on Cancer:

The reaction of tissues to the application of radium—Dr. Burton T. Simpson, Buffalo;

The treatment of carcinoma of the cervix—Dr. Wm. A. Scott, Toronto;

Radium treatment of oral carcinoma —Dr. W. L. Barlow, Montreal;

The treatment of external cancer by radium and x-ray—Dr. G. E. Richards, Toronto.

CLINICS

Thursday, June 23rd

8.30—10.00 a.m.—

Tuberculosis - - Western Hospital (8.30 a.m.—9.30 a.m.)

Pædiatrics - - Sick Children's Hospital

Medicine - - - St. Michael's Hospital

Surgery - - - - Toronto General Hospital Hospital for Sick Children

Obstetrics - - - Toronto General Hospital, Burnside.

Gynæcology - - Toronto General Hospital, Outpatients' Department

Otolaryngology - Toronto General Hospital, Outpatients' Department.

Friday, June 24th

8.30—10.00 a.m.—

Tuberculosis - - Western Hospital (8.30 a.m.—9.30 a.m.)

Pædiatrics - - Sick Children's Hospital

Surgery - - - - St. Michael's Hospital Sick Children's Hospital

Medicine - - - Toronto General Hospital.

SECTIONAL MEETINGS

SECTION OF ANÆSTHESIA

WEDNESDAY, JUNE 22ND

9.15 a.m.—Anæsthesia in children—Dr. C. H. Robson, Toronto;

The present status of avertin anæsthesia—Dr. Wesley Bourne, Montreal;

Spinal anæsthesia—Dr. Ralph M. Tovell, Mayo Clinic, Rochester;

Post-operative pneumonia—Dr. Wm. Cody, Hamilton;

Intratracheal administration of nitrous oxide—Dr. C. C. Stewart, Montreal.

SECTION OF EAR, NOSE AND THROAT

WEDNESDAY, JUNE 22ND

9.15 a.m.—The treatment of chronic nasal sinus disease—Dr. John G. Hunt, London;

Causes of persistent discharge following radical mastoid operation—Dr. J. K. M. Dickie, Ottawa;

Diagnosis and treatment of intrinsic carcinoma of the larynx—Dr. G E. Hodge, Montreal.

Sectional Meetings—*Continued*

SECTION OF HISTORY OF MEDICINE

THURSDAY, JUNE 23RD

10.30 a.m.—An account of the early medical practitioners who, after leaving the army, took up practice in Ontario—Dr. Jabez H. Elliott, Toronto;

Dr. J. W. Crane, London,
(Subject to be announced later).

Symposium on collecting antiques and other objects of medical interest. (Five to ten minutes per speaker.)

Medical book plates—Miss E. Poole, Toronto.

Pewter of medical interest—Dr. P. F. Summerfeldt, Toronto;

Antique medical books—Dr. John Ross, Toronto;

Antique infant feeding utensils—Dr. T. G. H. Drake, Toronto.

SECTION OF MEDICINE

WEDNESDAY, JUNE 22ND

9.15 a.m.—Treatment of pneumonia—Dr. Campbell Howard, Montreal;

Ten years' experience in the treatment of diabetes—Dr. F. B. Bowman, Hamilton;

Myalgia—Dr. Chas. Hunter, Winnipeg;

Heart murmurs—Dr. K. A. MacKenzie, Halifax;

The diagnosis of precordial pain—Dr. John Oille, Toronto;

Treatment of precordial pain—Dr. G. F. Strong, Vancouver.

THURSDAY, JUNE 23RD

10.30 a.m.—Asthma—Dr. George C. Hale, London;

Atypical forms of encephalitis—Dr. A. H. Gordon, Montreal;

The diagnosis and treatment of diseases of the parathyroid gland—Dr. Ray Farquharson, Toronto.

SECTIONS OF MEDICINE, SURGERY AND PATHOLOGY

FRIDAY, JUNE 24TH

10.30 a.m.—Symposium on Bronchiectasis—
Pathology—Dr. W. L. Robinson, Toronto;
Medicine—Dr. W. P. Warner, Toronto;

Sectional Meetings—*Continued*

Surgery—Dr. R. M Janes, Toronto.
Discussion—
Dr. A. H. Caulfeild, Toronto;
Dr. D. E. S. Wishart, Toronto;
Dr. N. S. Shenstone, Toronto;
Dr. E. W. Archibald, Montreal.

SECTION OF MILITARY MEDICINE

WEDNESDAY, JUNE 22ND

9.15 a.m.—Responsibility of the Canadian medical profession in national defence—Dr. E. S. Jeffrey, Toronto;

The present status of gas in modern warfare—Dr. P. A. T. Sneath, Toronto.

SECTION OF OBSTETRICS AND GYNÆCOLOGY

WEDNESDAY, JUNE 22ND

9.15 a.m.—Pyelitis of pregnancy—Dr. Gordon Foulds, Toronto;

Puerperal sepsis—Dr. W. A. Dafoe, Toronto;

Conduct of labour—Dr. E. K. Macellan, Halifax;

Non-puerperal pelvic inflammation—Dr. John Fraser, Montreal.

THURSDAY, JUNE 23RD

10.30 a.m.—Prolapse—Dr. W. B. Hendry, Toronto;

The use of x-ray in pregnancy—Dr. W. G. Cosbie, Toronto;

Occipito-posterior positions—Dr. J. D. McQueen, Winnipeg;

Some aspects of ovarian dysfunction—Dr. J. R. Goodall, Montreal.

SECTION OF OPHTHALMOLOGY

THURSDAY, JUNE 23RD

10.30 a.m.—Congenital naso-lachrymal obstruction (read by title)—Dr. A. E. MacDonald, Toronto;

The use of contact glasses in conical cornea (read by title)—Dr. Louis Kazdan, Toronto;

Transplantation of the lachrymal sac in chronic suppurative dacryocystitis—Dr. John MacMillan, Montreal;

Glaucoma, indications for operation and after-treatment—Dr. H. Waite, Boston;

Sectional Meetings—*Continued*

Motor anomalies in relation to prescribing lenses—Dr. Conrad Berens, New York;

Trachoma in Canada—Dr. Gordon Byers, Montreal.

SECTION OF PATHOLOGY

9.15 a.m.—Findings of special clinical interest revealed at post-mortem examinations—Dr. W. J. Deadman, Hamilton;

Pigment metabolism and anæmia problems—Dr. G. H. Whipple, Rochester, N.Y.;

The enlarged spleen—Dr. Geo. Shanks, Toronto;

Biopsy—Dr. Burton T. Simpson, Buffalo.

SECTION OF PÆDIATRICS

WEDNESDAY, JUNE 22ND

9.15 a.m.—A few difficult problems in the feeding of infants—Dr. E. A. Morgan, Toronto;

Mumps and its complications—Dr. H. B. Cushing, Montreal;

Tuberculosis in children—Dr. Alton Goldbloom, Montreal;

Some aspects of intestinal indigestion—Dr. Geo. Pirie, Toronto.

SECTION OF PUBLIC HEALTH

THURSDAY, JUNE 23RD

10.30 a.m.—The specific prevention of diphtheria—Dr. J. G. FitzGerald, Toronto;

Discussion—
Dr. Jas. Roberts, Hamilton;
Dr. W. L. Hutton, Brantford;

Scarlet fever toxin, toxoid and antitoxin,—laboratory findings—Dr. D. T. Fraser, Toronto;

Clinical observations on the use of fever toxin, toxoid and antitoxin—Dr. Beverley Hannah, Toronto;

Discussion of Dr. Fraser's and Dr. Hannah's papers—
Dr. Alan Brown, Toronto;
Dr. T. W. G. McKay, Oshawa;
Dr. Chas. Farquharson, Agincourt.

SECTIONS OF PUBLIC HEALTH, PEDIATRICS, OBSTETRICS AND GYNÆCOLOGY

FRIDAY, JUNE 24TH

10.30 a.m.—Care during delivery—Dr. D'Arcy Frawley, Toronto;

Post-natal care—Dr. Gordon Gallie, Toronto;

Sectional Meetings—*Continued*

The prevention of infant mortality during the first few weeks of life—Dr. Alan Brown, Toronto.

SECTION OF RADIOLOGY

WEDNESDAY, JUNE 22ND

9.15 a.m.—Mucosal gastric ulcers—Dr. S. R. Johnston, Halifax;

Multiple myeloma—Dr. W. A. Jones, Kingston;

Cardiac roentgenoscopy—Dr. M. C. Morrison, London;

Intravenous pyelography—Dr. W. C. Kruger, Toronto;

Ulcers of the œsophagus—Dr. W. L. Ritchie, Montreal.

THURSDAY, JUNE 23RD

10.30 a.m.—Diagnosis of acute intestinal obstruction—Dr. W. J. Cryderman, Toronto;

X-ray findings in malignant bone tumours—Dr. A. C. Singleton, Toronto;

Radiographic manifestations of diseases involving the teeth and jaws—Dr. E. H. Shannon, Toronto;

X-ray diagnosis of gall bladder disease—Dr. L. R. Hess, Hamilton.

SECTION OF SURGERY

WEDNESDAY, JUNE 22ND

9.15 a.m.—The management of hyperthyroidism—Dr. Gordon S. Fahrni, Winnipeg;

Sympathectomy in Raynaud's disease—Dr. D. E. Robertson, Toronto;

Sympathectomy in obliterative vascular lesions—Dr. R. I. Harris, Toronto;

The treatment of acute perforative appendicitis, a specific technique—Dr. Fraser Gurd, Montreal;

Gastrostomy—moving pictures—Dr. P. Z. Rhéaume, Montreal.

THURSDAY, JUNE 23RD

10.30 a.m.—Carcinoma of the Stomach—Dr. R. R. Graham, Toronto;

Injuries to the cervical spine—Dr. A. Gibson, Winnipeg;

Sectional Meetings—*Continued*

The operative treatment of spontaneous intracerebral hæmorrhage —Dr. W. G. Penfield, Montreal;

Indications for surgical treatment in diseases of the biliary tract.—Dr. J. W. Ross, Toronto.

SECTION OF TUBERCULOSIS

WEDNESDAY, JUNE 22ND

9.15 a.m.—Koch's discovery of the tubercle bacillus—Dr. W. J. Dobbie, Weston;

A study of infection and disease in contacts with open tuberculosis—Dr. D. A. Carmichael, Ottawa;

Pneumothorax—Dr. C. D. Parfitt, Gravenhurst;

The general hospital and tuberculosis—Dr. D. A. Stewart, Ninette;

Methods of cutting adhesions in artificial pneumothorax—Dr. Norman Bethune, Montreal.

SECTION OF UROLOGY

WEDNESDAY, JUNE 22ND

9.15 a.m.—Treatment of complications of gonorrhœa in private practice—Dr. W. P. Hogarth, Fort William;

Certain cases of hydronephrosis and renal calculi presenting gastro-intestinal symptoms—Dr. Emerson Smith, Edmonton;

The significance of backache in genito-urinary disease—Dr. M. I. Seng, Montreal;

THURSDAY, JUNE 23RD

9.30 a.m.—Some clinical aspects of the prostatic problem—Dr. A. I. Willinsky, Toronto;

Prostatectomy—Dr. Ingersoll Olmstead, Hamilton.

Tumours of the loin—Dr. Warner Jones, Toronto.

LADIES' PROGRAM

MONDAY, JUNE 20TH

1.30 p.m.—Luncheon at the Toronto Hunt Club, for the wives of members of the Canadian Medical Association Council. Hostess, Mrs. A. Primrose.

TUESDAY, JUNE 21ST

4.30 p.m.—The wives of the members of Council of the Canadian Medical Association will be guests of Mrs. F. N. G. Starr at tea.

8.30 p.m.—Ladies' Bridge at the Granite Club.

WEDNESDAY, JUNE 22ND

4.00 to 6.30 p.m.—The members of the Canadian Medical Association and their wives will be guests of Doctor and Mrs. Primrose at a Garden Party at Hart House Quadrangle.

9.00 p.m.—Osler Oration and Musicale, Convocation Hall.

THURSDAY, JUNE 23RD

4.30 p.m.—Garden Party at "Ardwold", guests of Lady Eaton.

7.45 p.m.—Association Dinner and Dance, Royal York Hotel.

FRIDAY, JUNE 24TH

10.00 a.m.—Golf Tournament and Luncheon.

2.00 p.m.—Drive for visiting ladies, followed by tea at the home of Dr. and Mrs. H. A. Bruce.

8.00 p.m.—Public Meeting, Concert Hall, Royal York Hotel.

GOLF

The Committee has obtained privileges at the Royal York Golf Club for the three days, Tuesday, Wednesday and Thursday, June 21st, 22nd and 23rd, for the purpose of playing the handicap medal rounds to decide the winners of "The Ontario Cup" and the "Hamilton Medical Society Trophy."

The matches will be played concurrently on all three days, but only members of the Ontario Medical Association may compete for the Hamilton Trophy. This match is played in two flights, 12 - 18 and 19 - 27 handicap. Members of the Canadian Medical Association whose handicap is over 24 are ineligible for "The Ontario Cup."

Players will report to the Committee on the tee.

Green fees, $2.00.

TRANSPORTATION

For the convenience of those attending the meeting, arrangements have been made for the purchase of railway tickets under the IDENTIFICATION CERTIFICATE PLAN.

1. Under this plan round trip tickets will be sold to Toronto upon presentation of an "Identification Certificate" for one way adult fare and one half, plus 25 cents; sufficient will be added to make the fare end in 0 or 5. The minimum round-trip fare will be $1.25.

2. Tickets for members of the family may be purchased at the same time, with the same certificate and on the same terms.

3. Children under five years of age and accompanied by parent or guardian, free; five years of age and under twelve, one-half the regular

adult fare plus 25 cents. The minimum round trip fare will be 75 cents.

4. Tickets may be used only via the same route in both directions, over lines shown in current tariffs.

5. *Dates of Sale.*—Three days (not counting Sunday) before the opening date of the meeting, or the first three days of the meeting, (not counting Sunday); *i.e.*, date of purchase and departure from home, June 16th to 22nd.

6. *Return Limit.*—Thirty days in addition to date of sale.

If you wish to travel by the Identification Certificate Plan, please advise the General Secretary of the Association, 184 College Street, Toronto, and an Identification Certificate will be mailed to you.

PROPOSED AMENDMENTS TO BY-LAWS

I. According to the present By-Laws of the Association, the Article dealing with meetings of Sections,—Chapter 4, Section 2, reads as follows:—

> "The Chairman and Secretary for each Section shall be elected by each Section during the annual meeting, at a time provided by Council. They shall hold office until the conclusion of the next annual meeting."

On several occasions during the past few years, many Sections of the Association have not met at the time of the annual meeting, and, therefore, were not privileged to carry out the duties laid down in the By-Law above referred to. To meet this situation, the following Sub-Section of the said Section 2 is proposed as an additional clause:—

> "Where any Section fails for any cause to appoint Sectional Officers in any year, it shall be in order for the Executive Committee to nominate officers for that Section for the year."

II. Again quoting from the By-Laws, Chapter 8, Section 1, paragraph 2, in referring to the Executive Committee, says in part:—

> "At its first meeting, it shall appoint an Editor and Managing Editor of the *Association Journal*, shall define their respective duties and fix their salaries, shall appropriate a sum from the funds of the Association which shall be available for the ensuing fiscal year for the purposes of the Editorial Board."

In as much as the Editorial Board functions as a Committee of the Association analogous to other Committees, and, therefore, is not in need of operating through a separate fund set aside for it, but, on the contrary, operates through the general funds of the Association, Dr. F. S. Patch, the Honorary-Treasurer and Managing Editor, gave notice of motion at the last annual meeting that the above Section be amended by deleting the last Clause of the Section, which Clause reads as follows:—

> "shall appropriate a sum from the funds of the Association which shall be available for the ensuing fiscal year for the purposes of the Editorial Board."

The two amendments herein referred to will be presented to Council at the forthcoming annual meeting for disposition.

MEDICAL BOOK-PLATES AND OTHER HOBBIES AT THE JUNE MEETING

Have you your own book-plate? The Program Committee, which is planning for the combined annual convention of the Canadian Medical Association and the Ontario Medical Association in Toronto in June, has decided to hold another Hobbies Exhibit, a feature which has created considerable interest when arranged at previous meetings. An innovation on this occasion will be a collection of book-plates to which our members are invited to make loan contributions. The nucleus of this exhibit will be a loan from the excellent collection of Miss Edna Poole, librarian of the Toronto Academy of Medicine, who has the personal book-plate of many well-known Canadian and other doctors, and who will speak on this subject before the Historical Section. If any readers have their own "Ex Libris"; or that of any other member of the medical or allied professions, the loan of specimen copies would be much appreciated.

As in previous years, original etchings, paintings, carving, modelling, etc., by the profession will be shown. It is anticipated that collections, historical or current, of medical interest will be exhibited and the committee would solicit information relative to such work or collections. Correspondence may be addressed to the Historical Committee representatives, Dr. T. G. H. Drake and Dr. John Ross, or to Dr. Harvey Agnew, at 184 College Street, Toronto.

TENNIS ELBOW.—W. Knoll on the occasion of the international lawn tennis tournaments held in Hamburg in 1931, examined the elbow-joints of forty-one leading players, of whom twenty-nine were men and twelve women. In spite of the numerous occasions on which damage might have been sustained, the number of lesions in the joint demonstrable by x-ray examination was remarkably small. With the exception of one lady, aged 40, none of the women players showed any bone changes, probably owing to the fact that, with few exceptions, women players expend a much less degree of force than the men. Knoll is of the opinion that tennis elbow is mainly due to distortion of the radio-humeral joint, and damage to the extensor muscles, including the supinator longus. The only bone changes found were one case each of periostitis of the external epicondyle of the humerus, a slight elongation of the head of the radius, and a similar condition of the coronoid process of the ulna.—*Deut. med. Woch.*, Jan. 15, 1932, p. 84.

Hospital Service Department Notes

THE HOSPITAL AS A HEALTH CENTRE

The hospital is to-day a health centre. It educates doctors, nurses and technicians in medical work, and it provides its public with a demonstration of the best type of medical care. The first concern of every hospital must be the best possible care of the patient. All of the other functions, including research and medical education, must be limited so that they do not detract in any way from the care of the sick, nor hinder even slightly the speed of recovery.

Hospitals have been tremendously improved in recent years in order that they may supply the best type of medical care. Whereas hospitals could be conducted in 1900 with approximately one worker for each ten patients, many hospitals to-day have two workers for each patient. The cost of such additional labour is warranted by the increase in the quality of service given to the sick. The workers in hospitals to-day include not only the physicians but nurses, dietitians, laboratory workers, physical therapy technicians, x-ray technicians, orderlies, cooks, maids, engineers, ambulance drivers, clerical help, social service workers and similar personnel.

Nevertheless, regardless of the number of workers in an institution, the costliness of the equipment or the up-to-dateness of the scientific apparatus, the prime factor in the success of a hospital is the physicians on its staff. No one ever chooses a hospital because it has a handsome operating room or because its patients' rooms are furnished in Early American. A hospital is chosen because of the physicians who work within it. Increasingly, the physicians of the United States are becoming associated with hospitals as desirable places in which to work. Out of the 150,000 physicians in the United States to-day, almost 100,000 are associated with good hospitals.

The advance of medical science has made it possible to decrease the average length of stay in the hospital from fifteen days in 1910 to twelve days in 1930. Everything that can possibly be done is being done to lower the cost of hospital care. It must be recognized, however, that the provision of the best type of medical care is inevitably a costly matter. People must learn to save for inevitable sickness and to provide for the payment of medical and hospital bills, exactly as they have learned to save for the purchase of radios, motor cars, cosmetics and tobacco.

(From the Hospital Day Broadcast by Morris Fishbein, M.D.)

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, Secretary, 184 College Street, Toronto.

THE LOCAL HOSPITAL AS A TEACHING CENTRE

When reference is made to a hospital as a "teaching centre", one's first thought is of hospitals with university affiliations. This conception is incomplete. The smallest hospital in Canada has a definite opportunity—and a definite obligation—to be a teaching centre. The sum total of our knowledge of the healing art and our progress in local community health is determined to a large extent by the degree to which every one caring for the sick endeavours to make his or her personal experience available to others.

Firstly, the *medical staff*. More and more the staff members are appreciating the wonderful opportunities afforded them through their hospital connection of ferreting out obscure diagnoses, of informal consultation, and, through staff meetings, of reviewing the successes and otherwise of their colleagues. Perhaps the greatest advantage of hospital contact is the indirect one of scientific stimulation. Our leading administrators and department chiefs realize that every assistance on the part of the hospital to promote staff organization and study is more than justified. Moreover the local hospital should be a centre of education for the whole profession throughout the district, through its diagnostic services and other facilities, and by utilizing the hospital for county society and other meetings. Where interns are employed, every effort should be made by the medical staff and the administration to give these young men and women the practical training so necessary to supplement their more academic previous instruction.

Secondly, *the nurses*. The report of the Joint Study Committee on Nursing has emphasized the overproduction of nurses and the consequent serious unemployment; but, whether the graduates of training schools continue professional nursing, or whether they return to their home communities in other rôles, they are, wherever they go, oases of sound information on health matters, and are able to a greater extent than generally realized to influence public thought. It is most essential that every hospital with a training school make every effort to provide the pupils with that knowledge which will be of most value in later years. Despite the great disparity in educational standards found by Professor Weir, a greater effort is being made by hospitals each year to improve the standard of instruction. Moreover, many hospitals are now sending away at intervals graduate members of the nursing staff to improve their knowledge on special subjects.

Lastly, *the public*. That hospital which does not endeavour to meet its obligation to educate the public is hopelessly obsolete, no matter how fine its buildings nor how low its mortality rate. The first phase, that of overcoming the public dread of the hospital, is largely over; the second phase, that of making the hospital a source of general health knowledge to the community, is

the task of to-day. By demonstration to patients in the wards or in the dispensary, by establishing facilities to meet community needs, by developing research laboratories, cooperating with public health and voluntary health and social organizations, by the judicious use of enlightening publicity, by Hospital Day observation and even by the conversation of hospital personnel, particularly the nursing staff, ignorance can be overcome and health truth disseminated. Every hospital no matter how small nor how remote should be a teaching centre. G.H.A.

A HOSPITAL TAX APPLICABLE TO MEALS

For some years the Quebec government has been collecting a tax of 5 per cent on meals costing one dollar or more when served in public places. This sum which has been considerable in the aggregate has been used to assist the various public hospitals of this province, and many fine structures recently erected or now in the course of construction have received very substantial assistance as a result of this levy.

However, like other revenue sources, this fund has shown a greatly diminished return. Premier Taschereau has announced that the revenue from this source has diminished by $100,000. In order to continue the hospital aid to which the government is already committed the tax is now to be changed so as to become a tax of 5 per cent on all meals costing thirty-five cents or more. One factor making this procedure necessary has been the reduction in the price of meals as the cost of living has fallen, thus bringing fewer meals into the taxable class. The Premier pointed out also that from certain sources full collaboration had not been obtained, a 95-cent meal proving very popular.

Naturally considerable protest has arisen from restaurant and hotel keepers. Their association claims that the restaurants are already heavily taxed, that sales resistance would develop, that this tax discriminates against a class which must eat wholly or in part in restaurants, and that the tourist trade would be injured.

There is nothing better or more advantageous to mankind than prudent Diffidence; 'tis the guard and preservation of our lives and fortunes; our own security obliges us to it; without it there would be no caution, without which, no safety . . . For who can secure himself of Man's heart, hid in the privatest corner of the breast, whose secrets the tongue dissembles, the eyes and all the motions of the body contradict.—Astry, *Saavedra Faxardo.*

Medical Societies

THE EDMONTON ACADEMY OF MEDICINE

The regular monthly meeting of the Edmonton Academy of Medicine was held in the Medical Building of the University of Alberta on February 3rd, Dr. J. G. Young, President, in the Chair.

Dr. W. Duncan Smith presented a case of mycosis fungoides, with the patient present for demonstration. Dr. Harold Orr presented some of the salient features of the case together with the prognosis and treatment. Dr. M. Hall then gave the pathology and lesions from this particular case and of the disease in general.

A case for diagnosis was presented by Dr. J. W. Scott. The discussion was opened by Dr. W. A. Wilson. Drs. Day, Emerson Smith, Hepburn, John Wright, and Hall also discussed the case from various angles and the pros and cons as to whether this lesion originated in the upper gastro-intestinal tract or in the prostate. Dr. Rae then gave the post-mortem findings which were adeno-carcinoma of the upper part of the stomach, with metastases travelling via the lymphatics. It was believed that this lesion originated subsequent to partial gastrectomy. The prostate was negative, grossly.

Dr. R. F. Nicholls gave a very interesting paper on "Trachoma", tracing its origin to antiquity and stressing the point that the disease was brought to this country by emigrants and passed along from one person to another by contact with fingers, the common towel, etc. He described the treatment fully and also the provincial situation regarding recent outbreaks of this disease. The paper was discussed by Drs. Condell, Armstrong, Harold Brown and R. M. Shaw.

Prof. F. A. S. Dunn, of the Department of Pharmacy of the University of Alberta, gave a very instructive and humorous paper on "Ancient and modern Chinese medicines". Professor Dunn stated that practically all our drugs were known to the Chinese, but a great many of their medicines were not known to us. Although many of their preparations do not sound palatable they must have some virtue because they have stood the test of thousands of years. Professor Dunn greatly added to the interest of his lecture by having many specimens of Chinese drugs and preparations to show the members.

ST. JOHN'S CLINICAL SOCIETY, NEWFOUNDLAND

At the monthly meeting for March of the St. John's Clinical Society, Dr. J. B. O'Reilly read a paper on "Peritonsillar abscess," that was of more than usual interest to the general

practitioner, who generally meets these cases first.

Having referred to the anatomy and to the function of the tonsils, Dr. O'Reilly gave the indications for tonsillectomy and then took up the question of the treatment of cases of so-called "quinsy" or peritonsillar abscess. The usual treatment for these cases being medication and local applications he showed how unsatisfactory such treatment is, the time lost, the suffering, and the likelihood of a recurrence, and instanced the case of acute appendicitis. No up-to-date surgeon would delay operation after a positive diagnosis of acute appendicitis had been made. He would not wait for the time when the appendix is full of pus. But this is just what has been done in treating peritonsillar abscess. The unfortunate victim is forced to suffer excruciating pain, starvation, and the loss of valuable time from his work waiting for an abscess to form before relief can be obtained or given him.

Referring again to the anatomy of the part it is seen how the pus, migrating from the tonsillar fossa proper, follows the line of least resistance until it reaches the upper pole of the tonsil where it is free to expand in the areolar tissue of the palate and pushes forward in the palatal mucosa, the thinnest and least resistant place, just above the palatoglossus muscle. Infection, penetrating the lining of the bottom of a crypt, migrates through the tonsillar capsule and becomes active in the potential space between the tonsil and the aponeurotic lining of the fossa. This is the first stage of peritonsillar abscess. As the pus forms the tonsil is pushed towards the midline with œdema and dusky congestion of the mucosa, which is typical of the condition. The bulging above the tonsil is not yet present, although pain and dysphagia are marked. During this, the second stage of peritonsillar abscess formation, ordinary methods of approach will not evacuate the pus, and it is necessary to wait until expansion of the abscess in this limited space has resulted in migration upward around the upper pole of the tonsil, in the areolar space in the palate. This, the third stage in the development of the abscess, takes three to five days or longer. Even at this stage it is not always possible to reach the centre of the abscess with certainty.

It is now found that the most satisfactory treatment for peritonsillar abscess is a radical one, namely tonsillectomy. A few hours after a complete enucleation the patient's distress is relieved and the convalescence uninterrupted. We have been unable to trace any complications following the operation; the temperature falls immediately, sepsis is relieved, and the period of convalescence much shortened.

As regards the operation, it is better to operate under general anæsthesia rather than local, and it is well to have the suction ready immediately the dissector enters the capsule, and to be sure that all the tonsil is removed, as the tissues are brittle.

N. S. FRASER

Special Correspondence

The London Letter

(From our own correspondent)

The doctor's position in the question of what is called sex-education is not a very comfortable one. He is theoretically in a splendid position to advise on matters of sex and marriage, but in practice he is not always the best person to do this and his own knowledge may be dismally small, especially on the psychological side. At the moment we appear to be suffering from an overswing of the pendulum from the prudery of the Victorian era, when even the legs of the dining table were draped for decency's sake, to books and plays which bring a blush to the cheek of the modest practitioner, accustomed as he is to dealing with "the facts of life." There is a profuse literature now available for the lay public on sex matters and not a few books designated for the medical profession alone, a point in advertising which no doubt increases their illegitimate sale to inquisitive adolescents. Now the British Social Hygiene Council has announced a new departure which is the foundation of a "Personal Problems Bureau." Consultations will be by interview or letter for which it is proposed to charge two guineas and one guinea respectively. To all cases requiring medical assistance a list of authorities in the special field will be given to the client "for submission to *her* medical adviser." The italics are not present in the letter announcing this enterprise and they are inserted here to indicate the curious idea that only the female sex are to be included in this scheme, as if men had no sex problems! It may be remembered that a section meeting of the last annual gathering of the British Medical Association was devoted to the whole subject of sex-education and a special handbook on preparation for marriage is, it is understood, in course of preparation by the British Social Hygiene Council, with the blessing of the officials of the Church of England. Many problems arise out of this trend. Is there not a risk of all this sex-education being overdone? Will advice on birth control be included? And if so, what does the Church say to that? Is abortion to be ignored? And what about compulsory sterilization of the unfit? All these subjects are very much discussed in the press at the present time, while the pronouncements of a prominent member of the Bench, popularly known as the "bachelor

judge", in favour of all three measures serve to keep the ball rolling. Statistics from Russia, the only country where abortion is legal, are available and make striking reading, for skilled abortion has practically no death rate, while the secret, illegal practice has probably a greater influence on health and morbidity than is generally realized. One thing appears fairly obvious from all these discussions and that is, that the average doctor scarcely knows what to think on the three subjects of contraception, sterilization and abortion and wide disagreement exists in the profession. That being so, it would appear almost arrogant for the profession to attempt to lead the public without further knowledge. Sex-education of the doctor must precede any more drastic extension of such measures for the lay public.

The Medical Research Council's seventeenth annual report is now available and is noteworthy this year for the stand taken on the subject of medical patents. A group of research workers at the Council's Institute at Hampstead has carried to a conclusion a brilliant piece of work regarding the purification of vitamin D and in the crystalline product, "calciferol", it is thought that the pure vitamin has been obtained. This substance, which is 400,000 times as powerful as a good sample of cod-liver oil, should prove of great value in the prophylaxis of rickets, but its availability to the public is hampered by a "patent". It appears that Professor Steenbock, of Wisconsin, holds a British patent to cover all products of irradiating foodstuffs and under this heading comes vitamin D from irradiated ergosterol. The Council claims that British money and British work laid the foundation for this process by earlier unpublished work and certainly can claim the recent work of purification as the fruit of British labour. Yet royalties on the sale of this vitamin D are payable to an American university, Professor Steenbock having allocated to it his patent rights. This restriction on scientific work seems very unsatisfactory and it is not unnatural that the Medical Research Council should feel strongly that either all patents should be abolished in the medical field, or else there should be a very much stricter scheme for patenting all medical work. The latter would be, in the minds of many, an unfitting commercialization of the healing art.

Another recent development regarding the status of members of the honorary staffs of our hospitals, however, makes one wonder if the day of the medical profession as a noble body of self-sacrificing men and women is over. A joint committee of the British Hospital's Association and the British Medical Association has just issued its report and has come to the conclusion "that the time has come to recognize the claim of the visiting medical staffs to some share in the moneys raised for the treatment of patients in hospital, other than those provided by voluntary subscription or donation, for the treatment of free patients." By this it is meant that out of money contributed by patients, either in the form of some contributory scheme or direct payment to the hospital for "free" treatment the doctors concerned shall get a share. This decision is based upon an analysis of a very complicated situation, for the tradition of honorary service has more behind it than mere generous giving of work for the poor. The honorary staff have their hospital experience as a constant background to all their work, with private patients, in the training of students and in research, and once the principle is admitted that the consultant is being paid for his hospital work the patient may very well demand value for his money in a commercial sense. Perhaps twenty years hence we shall find hospital appointments sought not for the position they give in the medical world, but because the salary is a good one and the chance of prescribing medicines in which one holds patent rights is greatly increased thereby. That is not an unduly pessimistic guess at the way things may be going.

ALAN MONCRIEFF

London April, 1932.

The Edinburgh Letter

(From our own correspondent)

At a recent conference of delegates from Students' Representative Councils of the Scottish Universities, which took place in Edinburgh, a proposal was brought forward to submit to the Universities a request for the addition of another year to the medical curriculum. In view of the important issues raised by this suggestion, it may be of interest to quote some figures given by Sir Thomas Whitson, Lord Provost of the City of Edinburgh, in his inaugural address to the meeting, which seem to have a bearing on the subject. In 1893 there were 3,551 students of all Faculties at the University; to-day there are 4,440. There were then 38 professors, 3 lecturers, and 40 assistants—a total staff of 81. To-day there are 55 professors, 9 readers, 158 lecturers and 90 assistants—a total staff of 312. That is to say that while there are only 889 more students to-day, the teaching staff has increased by 230 as compared with 40 years ago. In 1892 it was optional for a medical student to graduate after a four years' curriculum, and about half of the total number of students took a four years' course. The medical teaching staff of the University then comprised 13 professors, 4 lecturers and 30 assistants—47 in all. The

number of graduates in that year was 230. The corresponding figures for 1931 are 19 professors, 49 lecturers, 48 assistants—115 in all. The number of graduates for 1931 was 170. That is to say, in the period under review the number of graduates lessened by 60 and the number of teachers increased by 68. These figures taken in connection with the suggestion that the medical curriculum should be extended to six years ought to make us pause and ask whither we are drifting. Is the medical student any better taught, and is the medical graduate of to-day any better equipped, than was his predecessor of forty years ago?. If some modification of the medical course is necessary, is it advisable that it should take the form of adding another year to the curriculum, a step that will necessitate the addition of more teaching, more teachers and much additional expense?

The Scottish Universities' Entrance Board met recently in St. Andrew's, when Principal Sir James Irvine presided. The Board considered the details of arrangements proposed for dispensing with a separate preliminary examination and utilizing (with the co-operation of the Scottish Education Department) the leaving Certificate paper in the case of candidates for the preliminary examination at the March-April period. The Board also considered a suggestion that in the case of students educated in Scotland the certificate of an English Examining Board should not be accepted as qualifying the holder for the certificate of fitness to enter upon a graduating course at a Scottish University.

At a recent Inter-Universities Conference held in Edinburgh, a movement was set on foot to procure the abolition of all classes on Saturdays. Owing to pressure of work many undergraduates, especially in the faculties of Science and Medicine have been unable to take advantage of the opportunities for athletics and physical exercise, and the time left for extra-mural affairs has become practically non-existent. In order to balance recreation and study, it is now proposed that all strictly university activities on Saturday should be prohibited, or at least that there should be no compulsion. At the same time, there will be nothing to prevent students from voluntarily surrendering their leisure, but no academic discredit would fall on those who wish to absent themselves on Saturdays.

The next Lord Rector of Edinburgh University is to be chosen in the autumn, when the new method of election comes into force. Under a recent agreement the political associations of the University have foregone their right to nominate candidates and the appointment will be entirely non-political. Already meetings of undergraduates have been held, and it is rumoured that a well-known Scottish judge who has always been closely associated with the University will be a nominee. Under the new conditions of election the necessary qualifications of a Lord Rector appear to be a willingness to work with the student body, and if possible to reside in Edinburgh, and to fulfill the official functions of the post. These have gradually fallen into disuse owing to the policy of electing absentee politicians who were merely figureheads, and whose sole contribution to the responsibilities of office was to deliver an address sometime during their three years' term of office. The present Lord Rector of Edinburgh University is the Rt. Hon. Winston Churchill.

The second edition of Dr. John D. Comrie's "History of Scottish Medicine" has just appeared. It is published for the Wellcome Historical Medical Museum by Ballière, Tindall and Cox. The first edition which was issued on the occasion of the inauguration of the Section for Medical History at the Meeting of the British Medical Association in Edinburgh in 1927 has been greatly expanded. The new edition deals with the history of medicine in Scotland up to the end of the nineteenth century. It is in two volumes and is profusely illustrated with over 400 pictures. Those who were acquainted with the first edition of Dr. Comrie's History will welcome this new contribution to the files of medical literature. They will not be disappointed. It is a book that no one interested in the history of medicine should miss reading and possessing. It is a most valuable addition to the records of medical history, which, while primarily of importance to the medical profession, will also be of interest to a wider non-medical public.

A movement is on foot to found a memorial to the late Sir Andrew Balfour, K.C.M.G., LL.D., first Director of the London School of Hygiene and Tropical Medicine. An influentially signed letter has appeared inviting contributions for this purpose. Among the medical men supporting the appeal are:—Sir James Crichton-Brown and Colonel P. S. Lelean, Professor of Public Health, Edinburgh University. Among other signatories are:—Lord Lloyd, formerly High Commissioner for Egypt and the Sudan, and Sir James Currie, formerly principal of the Gordon College, Khartum. Sir Andrew Balfour was a graduate of Edinburgh University and was awarded the Cullen Prize of the Royal College of Physicians, Edinburgh, in 1930.

The Royal Medical Society of Edinburgh held its annual dinner in the Hall of the Royal College of Surgeons on 18th February, 1932. Sir Norman Walker, LL.D., Vice-President of the Royal College of Physicians of Edinburgh and President of the General Medical Council, was the guest of the evening.

The thirteenth annual dinner of the East of Scotland Overseas Club was held in the Hall of the Royal College of Surgeons on 26th February. Dr. James Young, D.S.O. was in the Chair. This club is limited to those who were on active service overseas during the War.

The Medical Curling Club held its annual match against four Lanarkshire Rinks on March 2nd. The match resulted in a win for the Lanarkshire curlers by 68 to 53. The annual curling

supper was held after the match. Mr. W. J. Stuart, F.R.C.S. presided over a large and enthusiastic gathering.

A Heidelberg Letter

(From an Occasional Correspondent)

At the last colloquium on advances in scientific medicine held in the Kaiser Wilhelm Institut on January 25th, Dr. Ferdinand Trendelenburg, of Berlin-Siemensstadt, gave an address on "Objective Investigations of the Auscultatory Phenomena of the Heart and Lungs". In an extensive series of researches Dr. Trendelenburg has explored the field of heart tones, heart murmurs and the various respiratory sounds. By the use of an extremely sensitive microphone coupled to a series of amplifying tubes, similar to those used in modern radio receiving sets, it has been possible to record these phenomena accurately on films and in the case of the heart to relate their occurrence to the electrical phenomena as recorded in electrocardiograms taken simultaneously. Nothing surprisingly new has come from these experiments, but they have undoubtedly laid a sounder foundation for the interpretation of auscultatory phenomena. In normal persons it is easy to demonstrate from these tracings that the first heart tone occurs simultaneously with the onset of changes of electrical potential in the ventricles. Thus the first auditory vibrations, when related to the galvanometric curves, appear sharply on the upstroke of the QRS complex. It is interesting, however, that the sound waves due to the second heart tone cannot be related accurately to the T waves of the electrocardiogram, which are thought to indicate the stage of retreat of the electrical phenomena in the heart following ventricular systole. This point has been noted, indeed, previously with regard to apical cardiograms, which have often shown great variation between the mechanical evidences of the end of systole and the supposed electrical evidences as derived from the T wave of the electrocardiogram. One of the most interesting findings concerns the so-called metallic or ringing second aortic sound. In the normal individual the sharp and non-resonant second aortic sound is registered by Dr. Trendelenburg's apparatus as a single, sharp, diphasic deflection. When, however, the ringing second aortic sound is present, so characteristic of early sclerosis of the root of the aorta, the instrument records a long series of rapid vibrations usually giving rise to some 18 separate waves. The various murmurs are recorded faithfully and the crescendo presystolic murmur of mitral stenosis shows beautifully as a great increase in the amplitude of the deflections as the moment of systole approaches. The respiratory sounds are faithfully reproduced and show great increases in intensity and in rate of vibration over pneumonic areas in the lungs. Many of the failures of previous workers have been due to inability to adjust their instrument to the widely varying vibration frequencies that are met with in recording such different tones as those produced over the heart and lungs. No mention was made of studies concerning the physical signs of bundle-branch block; indeed this is a subject which is not mentioned a great deal in the German clinics. The instrument would seem to be ideal for the investigation of the time relationships of the double first sound that is heard not infrequently in these cases. Some years ago Sir Thomas Lewis studied four of these cases by the microphonographic method and concluded that the extra sound component was presystolic in time. The subject is important enough to warrant investigation with the newer and more accurate apparatus devised by Dr. Trendelenburg and his associates.

On February 18th, Prof. Otto Meyerhof reported the results of recent researches on lactic acid metabolism to the staff of the Kaiser Wilhelm Institut. It has been possible to show that cell-free preparations of the blood of rats and of geese have the same ability to build lactic acid as had previously been demonstrated for muscle extracts. This lactic acid formation follows the same curve as that for muscle extracts and is also related equimolecularly to the phosphate-buffering power of the medium. The lactic acid is derived from the blood glucose. Physiologically, this discovery is of importance, of course, because it points to a new agency by means of which the blood can adjust itself between acidity and alkalinity.

It is a source of constant amazement to see the eagerness and sincerity with which the scientific men in Germany take part in scientific meetings and discussions. Everyone seems to turn out to every lecture and colloquium, whether it bears directly upon his subject or not, and it is no uncommon thing to hear Professor Meyerhof questioning some visiting physicist about atomic arrangement or to hear Professor Kuhn quizzing a clinician concerning the chemical relationships of his work. Similarly, it is not uncommon for an eager questioner to interrupt the lecturer and to have his question answered while it is still "warm". Last week when Professor Winterstein, of the Kaiser Wilhelm Institut, gave a lecture in the Universität, a huge auto-bus was ordered and every member of the staff—professors, assistants and technicians—piled into it and attended the lecture together. The medical societies of Canada and the United States might well take a leaf from the book of the German scientific societies with regard to the conduct of their meetings and discussions. Firstly, the meetings are all adequately posted at least a week in advance in the various departments of the clinics and Instituts, and also noted in the newspapers; secondly, the speaker is either not introduced at all or the introduction is made in a few sentences; thirdly, the discussion relates purely to the subject at hand and there is neither praise nor censure for the speaker but only a

discussion of his work. Many medical discussions in our country are devoted too largely to the thesis of "You scratch my back and I'll scratch yours". When one discusser has congratulated the speaker upon his work it becomes necessary for everyone else who follows to do so and the result is a dizzying spiral of inflated praise. Similarly, personal criticism may occur and prove a nasty element. In Germany it seems to be assumed that if a man has been invited to speak he has done good work and it isn't necessary to spend the evening telling him so.

With reference to the large number of American students in the German Universities as mentioned in the last letter. A number of folders arrived yesterday from the Hamburg-America Steamship Co., describing their special department for the care of American students. Through their office it is possible to make arrangements for admission to a German University, to have the possible courses outlined, and to secure living accommodation before leaving America. It is especially noted in the folder that the entrance requirements in American Medical Schools are becoming more rigid each year and that there are no limitations as regards entrance to medical courses in German Universities. It is a question worth considering.

DONALD MCEACHERN.

Heidelberg, Germany,
January 28th, 1932.

Letters, Notes and Queries

A General Practitioner's View on State Medicine

Permission has been given to publish these refreshingly clear and forcible comments from a practitioner in western Canada.

". . . . I am coming to the opinion gradually, but definitely, that our whole system of medical practice needs overhauling, from the economic point of view. What fools we doctors be! What a vast amount of work we do for nothing! And how bad it is for us! Because work done without a return is, in the last analysis, not the best done. That is rather a broad thesis, isn't it? but I think it will hold good if you think it out. The return for our work should have either financial, or educational, or what one might call sentimental or emotional value. The first we must have—the second has an investment value, and the third gives one a personal satisfaction.

In the old days, before organized charity had assumed any proportions, every medical man had his own particular clientèle of patients whom he treated free; they were his own business; he derived from them the satisfaction of gratitude and confidence on their part, and the meeting of a certain pride on his own part that he would never see anyone "stuck". This was partly objective—which is best— and partly subjective; but both worthy and worth while. So the tradition of the profession came into being—no profession ever had anything half so fine; and Heaven forefend that it should ever be thrown overboard. That is our own private charity, our own personal contribution to the fund of human charity. But to-day, you know quite well that our generosity has been and is daily abused and exploited—that we are robbed and fleeced, not by the patients but by every dispenser of relief and charity afoot—from the government of province and city down to every twopenny-halfpenny organization that exists. Those who accept or receive relief and pensions and hospital relief, etc., receive all this free — yes: but *everything* they receive is paid for, except one thing and one thing only—their medical care. Hospital beds, hospital food, hospital clothes, drugs, dressings, the undertaker who buries them—do any of these go unpaid for? Of course not, and why should they? But our work is never paid for. If we were *giving* our help to those who receive it, because we knew them, and they were our patients, and to that extent our friends, and there was a personal relation between us, all very well. But we are giving our services to a state, or a city, or an organization, who are not even thanking us for it. Why, when a certain pensions act was passed in this province, the head of it had the cheek to write to the local medical associations, asking us to go on record as looking after the pensioners for nothing. All other expenses were budgeted for but sickness; and to this day these poor folk must go to the outdoor department and accept charity —yet the idea was that they should be given enough to live on. Our answer, by the way, was that we refused to go on record to any such effect—that individual medical men would be left to do what they saw fit, with any patients who came to consult them.

Then, consider insurance companies. The casual way in which they write asking for a report on some patient—and if haply you are dilatory in your reply, comes a rather peremptory letter. Why should we furnish these reports free? The City Relief Department writes demanding a certificate, and the Board of Pensions Commissioners has a very nifty game of its own. Why should we alone, of all those who deal with the poor (I mean only when these are wards of the municipality, province, or what not) be expected to give our time, and thus our money, for nothing? We pay taxes in full—we get no consideration for our gift—

Answers to questions appearing in this column should be sent to the Editor, 3640 University Street, Montreal.

in fact, here, as in other cities, we are gouged an extra yearly 'professional tax'.

I hope that eventually we may be able to get the profession seeing things in this light. It does in Denmark; it does in France; it is beginning to in England. I think we suffer a loss of dignity or place when we tamely submit to injustice and unequal treatment. We lose other things; we lose in leisure, in security, and by the weakening of that feeling of self-respect that a man has when he feels that he does good work for what he gets, and is able to demand and enforce fair treatment for himself.

Oh well, it's all a problem. See what you think of it. There can be no speedy solution I expect. We are still so unorganized, one had almost said, disorganized. There are signs, of course, of 'clumping'. Clumping, however, is frequently a sign of death, isn't it? *Absit omen.''*

Umckaloabo

To the Editor:

I have read with more than passing interest the correspondence in the March number of your *Journal,* relative to ''Umckaloabo''.

In pursuance of your request for information regarding the subject, I may say I have recently been presented with a copy of *The Empire Review,* February, 1932, an English publication, in which there is an article on ''Umckaloabo'' from the pen of one Adrian Sechehaye, M.D., of Switzerland. This article is most emphatic in the praise of the product. A circular letter without signature was also to be found loose in the magazine, further urging the invalid to take immediate advantage of the ''cure''.

I have also had three separate enquiries concerning the use of the drug, and have come to the conclusion that advertising in some way must be reaching sufferers from tuberculosis.

C. J. W. BECKWITH, M.D.,
Resident Physician,
Nova Scotia Sanatorium.

Kentville, N.S.,
March 23, 1932.

A Disclaimer

To the Editor:

I have had another letter from a Canadian physician concerning the activities of some firm of photographers, apparently located in Montreal, that seems to be sending its representatives to various places in Canada claiming to have a commission from the American Medical Association to secure photographs of Canadian physicians.

I have just written our latest inquirer, informing him that the scheme seems to be in the nature of what is known in Chicago as a ''racket''. The American Medical Association has not commissioned any photographers in Canada to secure pictures for the Association and I can not conceive of any conditions under which such commission would be given.

(Signed) OLIN WEST,
Secretary and General Manager,
American Medical Association

Chicago, Ill.,
Feb. 13, 1932.

Dr. T. C. Routley informs us that the same scheme is being worked in Toronto. [ED.]

Aviation and Medical Aid

To the Editor:

It may be interesting for you to note that the new Superintendent of Algonquin National Park of Ontario is an aviator and has a Fairchild hydroplane with skis for use on ice. This is a great help not only in patrolling the park for poachers and fire but is of assistance in getting a doctor where train and other facilities are poor. Just the other day I made a forty-mile flight with him to attend an emergency case and he flew me back. The many lakes in this district make the landings and take-offs easy.

W. T. POCOCK

Kearney, Ont.,
February 8, 1932.

Topics of Current Interest

A Treatment for Baldness

If the surprising results recorded by B. N. Bengtson* are confirmed they may mark a notable advance in the treatment of baldness. Of the 16 cases dealt with in his preliminary report, 9 are stated definitely to have been cases of alopecia areata, of duration varying from 6 months to 23 years. The 7 remaining cases included two associated with Fröhlich's syndrome, which first impelled Bengtson to test the effect of pituitary injections; in one of the other cases the baldness followed trauma; in another it was due to luetic or associated luetic infection; and finally there were two described as universal alopecia, of 16 and 23 years' duration respectively. Of the 16 patients, 11 were males and 5 females. While the etiology of alopecia areata and the control of hair growth awaits elucidation, there is an increasing agreement that there is an important endocrine factor and a more or less intimate relation to the sex glands, as suggested by the development of hair at puberty, and (as pointed out by Sabouraud long ago) the rareness of bald-

* *J. Am. M. Ass.*, 1931, **97**: 1355.

ness in the eunuch. Fröhlich's disease includes dystrophy and loss of the hair, and its effective treatment by pituitary injections encourages the belief that the pituitary gland has an important influence over the growth of the hair. Bengtson's scheme is to give 1 c.cm. of anterior lobe extract hypodermically, at first once a week, then twice, and then three times. Simultaneously 0.5 c.cm. of the same extract was given on five or six days a week. Posterior lobe extract was given hypodermically in six cases, and thyroid in one case which did not respond to pituitary alone. The results recorded indicate that in all the 16 cases there was a gratifying response to the treatment. They are graded as follows: excellent (11), good (4), and fair (1). Two photographs illustrate the effects in alopecia areata, and one shows striking benefit in a man of 58 labelled senility and alopecia. The number of injections required to provoke growth of hair of normal colour and texture varied between 78 and 220. Bengtson points out that the types of baldness treated fall into the category of glandular alopecias, and he does not commit himself about the common type of senile or presenile hair loss, although he has recently begun treatment of such cases on the same lines, and reports "regrowth of lanugo hair and hair in four weeks on daily injections," in a case with the typical shiny crown and forehead since 1914. Every dermatologist will agree with him in his concluding sentence that "enthusiasm at this time is not warranted, and continued observations should be made until the merit or failure of this treatment is decided." Caution should be exercised furthermore in the matter of dosage. Half a gram of pituitary substance is a considerable dose, and on pharmacological grounds it would perhaps be wise to begin treatment with a smaller amount.

In a subsequent letter to the same journal (November 28th) Bengtson says that he has received several thousand letters about his method, and is unable to answer them. "The experiments," he adds, "while gratifying in certain types of baldness, do not indicate that a complete solution of this age-old problem has been realized."—*The Lancet*, 1931, **2**: 1363.

Athlete's Foot

"Athlete's foot" is the lay term for a fungus or ringworm infection which in late years has spread so rapidly over our country that it may be said to be epidemic at this time. The term is a misnomer since the condition is not limited to those engaged in athletics, nor is it limited to the feet. It occurs also on the hands, in the groin and arm-pits, and people of all ages, irrespective of their activities, seem quite disposed to infection.

A mould, or little plant parasite causes the disease. The ideal conditions for the growth of moulds in nature are moisture, a slightly acid condition, and, for many forms, darkness. These conditions are admirably fulfilled on the feet and in certain hidden recesses of the body such as between the toes, in the arm-pits and in the groin. The disease usually manifests itself first by the occurrence of tiny blisters containing a clear fluid on the soles of the feet and between the toes. On the hand, the places of election are between the fingers and on the palm. The little blisters soon develop pus and begin to cause intolerable itching. At this time contamination with the ordinary pus germs of the skin may take place, and serious infection may actively invade the blood stream.

With the disease in full bloom, it is not difficult to understand how easily it may be transmitted from one person to another. It seems quite likely that walking in bare feet in the shower bath and bathing rooms of gymnasia and swimming pools or the home serves to spread the infection.

The best preventive measures include the protection of the individual against infection on the one hand, and the treatment of supposedly contaminating floor surfaces on the other.

The use of paper slippers such as are commonly used in some golf clubs will do much to prevent the spread and contamination of the disease by eliminating contact of the bare foot with the floor. Second, patients bathing daily, whether at home or in public places, should never dress without thoroughly drying the body. Particular attention of course should be paid to the feet, the groin and the arm-pits. The liberal use of talc is also to be recommended.

The best way of sterilizing infected surfaces such as rubber mats, tile or composition tile floor, etc., is the daily application of live steam. A more laborious yet effective method is to thoroughly scrub the floors with a 20 per cent solution of lysol or some equally effective germicide. The towels in common use in swimming pools and shower baths should be subject to at least ten minutes of boiling. Ordinary laundering will not suffice to kill the infective agents. The same precautions which pertain to public places should also be taken in the home.

Unless active measures, such as those outlined above, are taken by all those who have to do with large groups of people, with the prevailing custom of communal bathing, we may expect to find so-called athlete's foot an increasing menace and an almost universal infection.—Dr. Udo Wilde, Director of clinical medicine, University of Michigan.

The Perfect Nurse

The nurse the doctor wants for his patients must have good breeding and an attractive personality and know how to handle people, besides being competent in her strictly professional duties. The doctor's idea of what a nurse should be is revealed by a questionnaire answered by more than 4,000 physicians in all part of the country for the Committee on the Grading of Nursing Schools. Skill in making patients comfortable and in general care tied for first place in the list of virtues set down for nurses by the medical vote. Next in esteem were skill in observing and reporting symptoms, care in following medical orders, good breeding, attractive personality, and skill in handling people. Specialists dealing with nervous cases, doctors handling children's diseases, and obstetricians, particularly, emphasized the importance of good breeding and personality. The nerve specialists were by far the most interested in having for their patients nurses who can handle people.

How well nurses succeed in living up to the doctors' ideal was revealed by the fact that nine out of ten physicians reported that they were getting the nurses they want and would be glad to recommend the nurse employed on their last case to their next patient.—*Science News Letter*, Dec. 20, 1930.

A Royal City Hospital, St. Thomas's

On the walls and in the courts and corridors of St. Thomas's Hospital are many evidences of its antiquity and progress through the centuries. The minutes of the Court of Governors are preserved, with a gap of eleven years, as far back as 1556, which was the third year of Queen Mary, of memory not wholly blessed. But none of the minutes is more remarkable for its consequences than the following, of January 18, 1882:—

> The Court having been informed that his Royal Highness the Duke of Connaught, K.G., had been pleased to express his consent to be put in nomination for election as President of this Hospital . . . . it was Resolved Unanimously—
>
> That his Royal Highness the Duke of Connaught be elected President of this Hospital.

Fifty years ago! St. Thomas's had then looked over the Thames for only eleven years. A decade later Henley could still write of it in his "London Voluntaries" as "the callow, gray-faced Hospital," though nowadays it strikes the Londoner as having found its place for an eternity or two. And during these 50 years the Duke of Connaught has played a presidential part in the affairs of St. Thomas's, deeply concerned for its welfare and, as his presence at their gatherings has shown, for the happiness of its workers.

The year 1212 was formerly taken to be that of the foundation of the Hospital, but the point remained doubtful until not long ago, when Professor F. G. Parsons, with the authority of the present Hospital authorities, took steps for a complete expert examination of the hundreds of manuscript deeds preserved in the British Museum as the Cartulary of St. Thomas's Hospital. A document of Edward I. was then brought to light containing a statement which shows that the Hospital was in being as St. Thomas's before 1212:—

> Whereas controversy was moved between Martin the Prior and the Canons of St. Mary's Church of the one part, and Amicius, Archdeacon of Surrey, Keeper, and the Brethren of the Hospital of St. Thomas, Southwark, concerning lands, &c., in the year 1215, whereby it was granted to the Brothers and Sisters of the old hospital of St. Thomas Southwark to go into the new hospital of St. Thomas, founded on ground of Winchester Church, &c.

In those early days the Governors, who themselves admitted and discharged patients, exercised summary and severe jurisdiction. Before dismissing the sufferers from foul diseases they had them flogged as a caution for future conduct. A sister for drunkenness on duty, not for the first time, was ordered twelve lashes, well laid on. Another sister was sentenced to be discharged from her office and sent to Bridewell. It is superfluous, and might verge on impertinence, to contrast the nursing under those conditions with that of the Nightingale nurses. Yet this glimpse of the old order does bring a reminder of the great School which Florence Nightingale founded in 1860 at St. Thomas's, and which has been a perennial source of strength to its nursing staff.—*The Weekly Times*, Jan. 21, 1932.

Smokeless Coal

The conference of the National Smoke Abatement Society, held at Liverpool over last week-end, was the third of its kind, and notable for the declaration of its president, Dr. H. A. Des Vœux, that smoke is simply a luxury of laziness. After dealing faithfully with factory smoke he admitted, however, that smoke from the domestic chimney will not be abolished until smokeless fuel is available at a reasonable price. Mr. Ralph Gibson, on behalf of the Liverpool Gas Company, replied that the gas industry could, if it would, produce a smokeless fuel giving the cheerful effect of coal, and such fuel was in fact sold by his company. In the past this kind of fuel has not proved commercially profitable, because of difficulty in disposal of by-products; but a potential ally of low temperature carbonization has now appeared in the so-called hydrogenation process. If hydrogen is applied under pressure to coal-tar products a high proportion is converted

into motor spirit, and it is understood that at least 100,000 tons of petrol a year are being produced in Germany in this way by a single firm. The application of this hydrogenation process to tar oils and creosote is now being tested by the government fuel research station at Greenwich with, it is believed, a yield of 92 per cent of motor spirit and Diesel oil from low-temperature crude oil. It is doubtful whether this semi-coke will completely solve our domestic smoke problem if we have to rely on its replacing coal by virtue of its own merits; probably some form of suasion may be required to prevent the use of smoky coal in domestic grates in cities. Such prohibition, however, would become a legitimate measure if the hydrogenation process lives up to its promise.—*The Lancet,* 1931, **2**: 698.

Contract Practice

R. G. Leland believes that although there are many details of contract practice which deserve much more detailed description and comment than is possible in his report, it may be stated that contract practice (1) took its origin largely from necessity; (2) has been legalized, in certain places, by state statute; (3) under certain conditions and in some forms is both ethical and legitimate; (4) in general, has become highly commercialized and competitive; (5) is largely limited to the pay roll class; (6) does not, in most cases, extend its provisions to women and children; (7) concerns itself, almost without exception, with curative medicine and does not include preventive measures; (8) shows no interest in public or individual welfare; (9) furnishes medical care which is often inferior in character; (10) in many instances is characterized by underbidding, subletting, misrepresentation and racketeering; (11) is economically unsound in many of its present forms; (12) is essentially sickness insurance, usually not supervised or regulated; (13) is often used by the operators thereof to influence legislation in favour of extension of the plan; (14) in many of its present forms lowers the confidences of both the individual and the public in the medical profession; (15) has some features that deserve refinement and extension and others that are unethical and dangerous and should be abolished.—*J. Am. M. Ass.,* 1932, **98**: 808.

A Governor Looks at Chiropractic

Governor Buck of Delaware has returned to the legislature, without his approval, a bill to create a board of chiropractic examiners and to regulate the practice of chiropractic. His summarization of the reasons for his veto is so clear and terse that it should be read by the legislators and governors of every state that is threatened or already afflicted with this cult. His statement follows:

"The purpose of the act, as I understand it, is to legalize the practice of chiropractic in this state. Practitioners of this cult are not recognized now. Do they profess to be doctors in the same sense of the term as is commonly understood to apply to men and women of the medical profession? Insofar as I am able to determine, there is not a recognized medical school in the country that includes in its curriculum a course in chiropractic. This fact in itself seems singularly significant.

"Even to the lay mind the idea that all disease of whatever character is due to spinal displacements of a mild sort, and that cures of such ailments as tuberculosis, smallpox, diphtheria, scarlet fever and others can be effected by manipulation and fingering of the spine is preposterous.

"Before returning this bill to you I have satisfied myself that the training and education a chiropractor, or drugless healer, needs to practice his art does not fit him properly to advisedly treat the sick, inasmuch as he is not qualified to diagnose ailments nor recognize communicable diseases and to take measures to control them. He is therefore an opponent to the department of health.

"Wherefore, it seems to me it would be inconsistent for the legislature to appropriate, as it will do, money for the state board of health, which board is trying to eradicate communicable diseases, and at the same time legalize the practice of a cult which does not believe in the germ theory of a disease but does teach and believe that such diseases as scarlet fever, etc., are due to a distracted vertebra and the method to prevent and cure such disease is to see that everybody has a normal spine."—*J. Am. M. Ass.,* 1931, **96**: 1148.

UNSUSPECTED DANGERS OF BUTTER. — Rats are obviously hostile and dangerous to humanity, but if anything looks innocent, is it not that vitamin-provider, butter? Professors Levaditi, Kling, and Lépine, however, have suggested that it takes a share in disseminating infantile paralysis. They have demonstrated by experiments with monkeys that butter is a most successful virus carrier, even after it has been kept at a temperature below freezing point for three months. They conclude that butter should be suspect in cases of epidemics, and that prophylactic measures should be taken. How this is to be done is something of a problem.

Abstracts from Current Literature

MEDICINE

Arterial Atony and Arteriosclerosis. Plesch, J., *The Lancet*, 1932, **222**: 385.

The author sets out the thesis that arteriosclerosis is a constitutional disease chiefly affecting unstriped muscle, that atheromata serve to strengthen the walls of vessels rather than weaken them, and that the disease is not progressive and incurable but can be arrested. The primary cause is a weakening of the muscular and elastic elements of blood vessel walls followed by dilatation, repair by atheromata, and finally deposits of calcium. It is pointed out that a vessel rarely ruptures at a calcified area and several microphotographs showing changes in the elastic tissue are given in the text. All factors causing general loss of tone may also cause arterial atony. This occurs in young people and is followed by arteriosclerotic repair of this atonic and dilated vessel. One serious result of this loss of tone is increase of total blood volume due to pooling in the vascular system. This places a greater load on the heart and leads to cardiac hypertrophy even in the absence of increased peripheral pressure. Angina, whether cardiac, cerebral, or of the extremities, is stated to be spasm following over-dilatation of these atonic vessels. Treatment is outlined in a general way to overcome the atonicity rather than to attempt to treat the hypertension, which is only a symptom of the underlying condition. Vasodilators are condemned because they increase atony. Several diagrams and skiagrams of the heart illustrate the points brought forth in support of this thesis. J. B. Ross

Angina Pectoris Associated with High Blood Pressure and its Relief by Amyl Nitrite. Lewis, T., *Heart*, 1931, **15**: 305.

Angina pectoris has been called nothing more than a syndrome by most clinicians. Now Sir Thomas Lewis has started the clinical classification of cases which would ordinarily fall into that group known generically as "angina pectoris". As the author suggests, very little advance has been made in the study of the etiology of the disease simply because the group was not sufficiently defined.

As is often the case with Lewis' work, he has in this instance taken only a small number of cases of a certain disease, but he has studied them so carefully that the work will remain a lasting contribution to the subject. The author presents four patients with angina pectoris who were closely observed particularly for changes in the blood pressure and the pulse rate during an attack of pain. Three of the patients were much younger than those who are generally predisposed to the disease—34, 33 and 20 years respectively. All the cases reported occurred in males. In every patient there was distinct evidence of aortic insufficiency, which was syphilitic in origin in one case and probably rheumatic in the remaining instances. Lewis found that in all of his cases there was a well-marked rise in the blood pressure and an increase in the pulse rate during the attack of pain. Moreover these manifestations could be detected several minutes before the onset of pain, and they might last for some time following the disappearance of the pain. The author concludes therefore that the increase in blood pressure and the tachycardia observed in this group is not responsible for the pain obtained. He suggests that a "vasomotor storm" may account for all the phenomena seen, but that all these do not bear an etiological relationship to one another. Amyl nitrite was found to be particularly effective in the treatment of the cases under consideration. The drug does not invariably produce the diminution in blood pressure which is said to follow always upon its administration during an attack of angina pectoris, although the relief from pain is always secured. The orthodox view is held that angina pectoris is due to a relative deficiency of the blood supply to the heart, amyl nitrite producing its effects by dilating the coronary arteries and thus increasing the blood supply. Four authentic cases culled from the literature are tabulated so that they may be compared easily with Lewis' cases. The cases are alike in nearly every respect, hence, there appears to be sufficient justification for the creation of this new group.

Since most of the symptoms and signs seen in these patients can be attributed to increased peripheral spasm resulting from constriction of the arterioles, and since Nothnagel's syndrome as well is said to be the result of this, the author takes pains to point out the essential difference between the two. Nothnagel's syndrome is characterized by anxiety, palpitation, vertigo, coldness and numbness of the extremities, but precordial pain has been observed rarely. The author feels certain that this latter syndrome is not a disease of the heart. J. FEIGENBAUM

Rheumatic Heart Disease. Editorial, *New Eng. J. Med.*, 1932, **206**: 479.

Among the newer or more clearly defined knowledge of the rheumatic infection are the following facts or concepts. (1) Acute valvular disease may occur insidiously, frequently without any joint symptoms whatsoever, but in just the same form as that found with acute polyarthritis; such endocarditis has been much more frequently overlooked in the past than it is to-day. (2) There has been a modification

of the character of the rheumatic infection during the last generation, in part, probably, because of the frequent and world-wide use of antirheumatic drugs such as the salicylates. (3) There is a definite relationship between upper respiratory infections, especially with the hæmolytic streptococcus, and the occurrence or the recurrence of rheumatic endocarditis; years ago the tonsils were almost the sole focus of attention in this respect. (4) Climatic conditions are of great importance with respect to the incidence of the rheumatic infection and to the protection of a rheumatic subject against recurrent infection, a tropical climate being strongly protective; this had been hinted at years ago but not so clearly shown as now. (5) There is a very distinct tendency for the rheumatic infection and rheumatic heart disease to occur in several members of the same family, as proved by several analyses in the last ten years, which suggests, among other things, contagious and predisposing elements. (6) The manifestations of the rheumatic infection are no longer considered to be limited to the heart, pericardium, pleura, joints, and skin, but are known to be widespread throughout the body, even involving arteries, lungs, and peritoneum. (7) There is more and more evidence that the involvement of the heart and other tissues of the body in the rheumatic is an allergic phenomenon and not a response to direct bacterial invasion.

LILLIAN A. CHASE

Familial Liver Cirrhosis. Chapman, A. W. and Barber, A., *Arch. Ped.*, 1931, **48**: 316.

The family history of the two brothers who form the basis of this report is of interest. The maternal grandparents are living and well. The mother's brother as well as the mother herself are well. A younger sister of the mother had been anæmic since childhood, had had an enlarged liver and spleen since early childhood; had a severe hæmatemesis at 12 and again at 13; had severe hæmorrhages from the stomach and bowel at intervals of ten months to a year. These continued until she was 18, when an unusually severe hæmorrhage caused her death.

The father, his parents, and his eight half sisters were all healthy. The five children of these two parents were an anæmic underweight girl of 18, two healthy girls of 12 and 6, and the two patients, 13 and 10.

The first patient was a boy of 7 with a history of repeated unexplained attacks of nose bleed, and an attack of vomiting blood at the age of 6. Medical aid was not sought until the second attack of blood vomiting when he was 7. Physical examination showed secondary anæmia, with the hæmoglobin down to 30 per cent. The liver was enlarged to one inch below the costal margin. The spleen was not palpable, although a few months later it was definitely enlarged. Frequent attacks of hæmatemesis occurred in the next six years, until one occurred which was fatal in a few minutes. Autopsy revealed a cirrhotic liver, a much enlarged and congested spleen, and a ruptured œsophageal vein.

The second boy, born two years after the first, died one year before him. His history was much like that of the older brother, with repeated attacks of nose bleed, his first hæmatemesis at 6, clay-coloured stools, which now became tarry; an attack of gastric and intestinal hæmorrhages followed by convulsions which left him blind for 3 weeks; enlarged liver and spleen, with the latter constantly enlarging, while the liver regressed later. A final hæmorrhage from the œsophagus or stomach, lasting ten minutes terminated the picture. Autopsy revealed a ruptured œsophageal vein in his case also, a spleen twice its normal size, and a cirrhotic liver.

MADGE THURLOW MACKLIN

Diagnosis of Amyloid Disease by the Intravenous Injection of Congo-Red. Wallace, J. E., *The Lancet*, 1932, **222**: 391.

The writer draws attention to the new methods of diagnosis of amyloid disease by the intravenous injection of congo-red. Theoretically, the congo-red is taken up by the amyloid tissue and disappears from the blood plasma with great rapidity. The technique of this test is given in detail and briefly consists of intravenous injection of the dye with samples of blood taken four minutes and sixty minutes after the injection, and samples of urine, fifteen minutes and forty-five minutes after injection. The author's cases were tuberculous children with chronic suppuration. The results of the test coincided very accurately with post-mortem findings in amyloid disease. In pure tubular nephritis there is a marked excretion of the dye from the kidneys. No other condition was observed which mitigated the value of this test, and it apparently gives a very accurate qualitative and quantitative index of the presence of amyloid tissue.

J. B. ROSS

Accidents due to Sensitization to Insulin. Cade, A., Barral, P. and Rown, J., *La Presse Médicale*, 1931, **2**: 1917.

In 1923 Banting, Campbell and Fletcher pointed out that following the injection of insulin there occurred, at times, allergic phenomena. This idea was taken up by various workers, such as Tuft, Cade, Barral, Engelberg, so that now the subject is well understood. Various case reports of insulin-anaphylaxis have appeared in the medical literature. As the authors point out, the allergy may be produced in two ways: (1) by the presence of foreign

proteins in the incompletely purified insulin; (2) by actual sensitiveness to the insulin itself which, then, acts as the antigen. The phenomena are those of allergy in general:— tachycardia; hypotension, lipothymia, syncope; dyspnœa, abundant mucous expectoration; vomiting, diarrhœa; erythema, urticaria, transitory œdema; agitation; the Arthus phenomon (local anaphylaxis).

This syndrome has a sudden onset and occurs rapidly after the insulin is given. Moreover, it is transitory and practically never of a serious character. The writers describe a series of experiments carried out upon animals to find the true antigen in such cases. They come to the conclusion that allergy is uncommon in insulin therapy. In addition, they consider that the reaction is most commonly due to animal proteins being present from incomplete purification of the insulin. However, they stress the fact that insulin itself may be the antigen. It is necessary to distinguish this allergic state from hypoglycæmia which, in some respects, it resembles. The presence of cutaneous lesions—erythema, urticaria, et cetera—should make one suspicious. Hypoglycæmia phenomena do not develop immediately after the injection, whereas allergy usually does. Allergy follows more regularly each injection, while hypoglycæmia is irregular in onset. The diagnosis of the existence of a condition of allergy may be verified, to some extent, by biological methods, such as:— cutaneous reactions; passive anaphylaxis of animals; the Praussnitz-Küstner test, and deviation of complement.

How are we to handle such cases? Specific and non-specific desensitization may be essayed. Repeated small doses of insulin or gradually increasing doses of diluted insulin have helped. Calcium chloride orally, with Witte's peptone, one hour before the insulin administration, is recommended by the authors. It is rarely necessary to suspend the administration of insulin for several days.

H. A. DAVIS

A Case of Coryza and Asthma due to Sand Flies (Caddis Flies). Parlato, S. J., *J. Allergy*, 1929, **1**: 35.

The author's patient suffered from seasonal coryza and asthma which she herself related to exposure to swarms of "sand flies" about her Niagara River home. An extract of these flies was made, and the patient gave positive skin and eye reactions to this extract. Controls were negative. Passive transfer of sensitivity was successful. No sensitivity to any other antigen was discovered. Desensitization with the extract of sand flies gave relief of symptoms.

These flies, the author writes, shed tiny hairs and epithelial scales, which reach the susceptible patient and produce symptoms. The effect is likened to that produced by the danders of domestic animals.

T. G. HEATON

The Sand Fly (Caddis Fly) as an Exciting Cause of Allergic Coryza and Asthma. Parlato, S. J., *J. Allergy*, 1930, **1**: 307.

Aroused by the above case, the author made routine test with sand fly extract in all his cases of allergy from April to December, 1929. He used the ophthalmic as well as the intradermal method. Appropriate controls were carried out by repeating the tests on normal, non-allergic individuals.

He studied 192 cases of allergy, and found 14, or 7 per cent, who gave positive skin and eye reactions to the sand fly extract. All these gave a history of contact with great numbers of sand flies. Six of the 14 reacted *only* to sand flies, and 2 only to sand flies and bacteria. The remaining 6 reacted also to pollens or other usual antigens. Two such cases are reported in which desensitization to the other antigens was unsuccessful and symptoms were unrelieved till sand-fly therapy was instituted. He advises the use of sand-fly extract in testing all allergic patients living near lakes, rivers and ponds.

T. G. HEATON

Emanations of Flies as Exciting Causes of Allergic Coryza and Asthma. Parlato, S. J., *J. Allergy*, 1932, **3**: 125.

Carrying his investigations farther, the writer recalls the brownish powder which comes off moths or butterflies when one picks them up, and suggests that the epithelial products of these creatures may cause asthma and hay-fever in persons susceptible.

The common clothes moth "sheds considerable dust which on inhalation can cause asthma or hay-fever". "A short auto ride through the country or the city parks brings one in contact with swarms of sand flies, moths, and butterflies. Striking the radiator or windshield they throw out a considerable amount of emanations which may cause allergic symptoms to the driver or passengers". The author reexamined glass slides which he had exposed in various parts of Buffalo, N.Y., during 1925, 1926 and 1927. He found an abundance of insect hair and epithelial scales on the slides, so much that *on some days the amount corresponded closely to the amount of pollen found on the slides.* He finds them also in house dust. His microphotographs are convincing.

He reports a case which he believes to be one of hypersensitiveness to moths and butterflies, and plans an extended trial of these antigens in skin testing during the coming season.

T. G. HEATON

SURGERY

The Natural History of Duodenal Ulcer. Ryle, J. A., *The Lancet*, 1932, **1**: 327.

This article is a Hunterian lecture and gives the writer's experience in his private practice of 218 cases of duodenal ulcer, 35 of anastomotic ulcer, and 8 other surgical disappointments. The writer gives proof that the incidence of the disease is increasing. At Guy's Hospital duodenal ulcers total 1 per cent of all admissions and in his practice they are 5 per cent of all his cases. The average duration of the disease before a diagnosis was made was seven years. The author thinks that certain constitutions, heredity, and the "steerhorn type" of stomach are usual in the etiology of the disease. In his series 10 per cent showed a hereditary disposition, and he feels that his percentage is low, as many did not have an accurate diagnosis previously. The steerhorn type is most common in the male, and this probably may have something to do with the preponderance of the disease in the males; in this series it is four to one. The age incidence in 50 per cent of cases was between 30 and 50, the youngest 19 and the oldest 83. Professional men and city dwellers show the greatest incidence. Tobacco, the author thinks, probably has something to do with the continuance of the disease. Focal sepsis is a possibility. Environment, climatic conditions and the season also play their part. He states that "a restless stomach accompanies a restless mind," and wonders if the disease would occur in the absence of psychological turmoil. He gives a detailed account of the course of a duodenal ulcer and agrees that symptoms must surely bear some relationship to activity. In his series perforation occurred in approximately 5 per cent; pyloric stenosis in 11 per cent. The hospital mortality of duodenal ulcer is about 7 per cent. Pain is an outstanding symptom. The severity of the pain tends to increase with the chronicity of the ulcer. Temperature following hæmorrhage, he agrees with Hurst, is probably due to retention of blood in the bowel. Perforation is most frequent in the early stages of the disease and diminishes with the passage of time.

He believes that short-circuit operations are contraindicated in young persons with short histories. In anastomotic ulcers, 12 patients had a hæmorrhage, 8 of which bled following operation. Of 23 persons who did not bleed before the operation, 10 bled subsequently. He feels that hæmorrhage should not be regarded in itself as an indication for gastric jejunostomy.

His present policy, based on experience, is to advise gastro-jejunostomy in cases of pyloric stenosis; in cases of long standing duodenal ulcer in which clinical history, x-rays, and test-meal proclaim gross scarring or anchorage and a tendency to slow transit of food without serious stasis, and in which there has been recurrence in spite of one or more strict courses of medical treatment; in cases presenting the syndrome of anchorage to or erosion of the pancreas; and in cases of concomitant duodenal ulcer and duodenal ileus, where, again, there is an obstructive factor at work obviating sound healing by mechanical unrest and increasing the likelihood of perforation by increased intraduodenal pressure. His policy is to oppose surgical treatment in youthful cases; in non-obstructive cases with short histories and adverse pedigrees and in those not previously accorded a strict medical treatment; in cases with recent hæmorrhage, lacking other indications; and in cases in which x-ray and test-meal show gastric "hurry", for here to accelerate emptying still further and to attempt to anastomosis in the presence of exaggerated motor and chemical unrest is to create just those conditions which may be held to favour secondary ulceration. Highly nervous individuals and elderly subjects should often be deemed unsuitable for surgery, even when the only alternative is continuous medical and dietary care. Economic and environmental factors must at times compel a modification of general policy. Surgical treatment should always be followed by a period of strict medical treatment and proper precautions thereafter. Psychological as well as physical requirements must be carefully studied.

W. L. GRAHAM

Hæmophilic Arthritis. Key, J. A., *Ann. Surg.*, 1932, **95**: 198.

Hæmophilic arthritis may be divided into three stages: (1) hæmarthrosis; (2) panarthritis; (3) regressive.

As a result of a known or unknown injury bleeding occurs into a joint previously apparently normal. The joint is distended under a pressure equal to the systolic blood pressure as the blood does not clot for some time. The irritation caused by the presence of blood results in a hyperplasia of the synovial membrane. Blood pigment is laid down in the subsynovial tissues. Each new hæmorrhage is an added irritation. Folds and villi are formed by the synovial membrane. The area about the joint becomes saturated with blood pigment. If the tendency to bleed ceases the synovial membrane tends to return to a more nearly normal state. Formation of dense fibrous connective tissue in the subsynovial tissue results in a marked decrease in size of the synovial cavity. Fibrous ankylosis may finally result due to (1) thickening and shortening of the fibrous capsule and ligaments and (2) to the production of fibrous tissue in an abnormal situation.

The cartilage remains unaffected for a long time. Eventually it is eroded around the margin by encroachment of hyperplastic

synovial membrane. Spotty destruction occurs over the articular surface. The destroyed areas are irregular in contour and are termed "map-like". They do not correspond to pressure areas. Bony ankylosis has not occurred in any hæmophilic joint. Cavitation in the intra-articular portions of bone is the characteristic bony feature. They may be depressions on the sides or cavities in cancellous bone. Joint disturbances nearly always begin in childhood. The swelling may be sudden or gradual, and usually occurs spontaneously. Pain and functional disability may be slight or marked. Redness and œdema are not present. Dark bluish areas may appear near the joint. There may be slight fever. Permanent changes do not occur until after several attacks. The joint may remain swollen and tender for several weeks or months. More or less permanent disturbance of function results. In the regressive stage there is soft crepitus on motion. Amount of motion is limited. Pain has largely disappeared.

After an acute hæmorrhage the patient should be put to bed. The involved joint should be immobilized until pain disappears and the blood is largely absorbed. Aspiration should rarely be done.

No attempt should be made to correct the deformities unless they form a definite handicap to the patient. Open operation should not be resorted to. Careful traction, wedging, and other manipulative efforts are the only methods of improving position.

STUART D. GORDON

Paget's Disease a Predisposing Factor to Osteogenic Sarcoma. Coley, B. L. and Sharp, G. S., *Arch. Surg.*, 1931, **23**: 918.

Paget's disease of bone (osteitis deformans) and osteogenic sarcoma are frequently associated in patients over 50 years of age. Sir James Paget was the first to describe, in 1877, the disease which bears his name. It is a constitutional disease which may manifest itself in one or more bones. The skull is a favourite site. The cause ascribed is a defective metabolism of calcium, with an underlying basis of dysfunction of the parathyroid glands. This disease is similar in many respects to osteitis fibrosa cystica (Von Recklinghausen's disease) which also is due to some disorder of the parathyroid glands associated with a high rate of excretion of calcium. The bony changes of Paget's disease are characteristic and result from the destruction of bone as well as the formation of osteoid tissue, bringing about changes in size, shape, and structure of the area of bone involved. The medullary cavity is encroached on. The spine and the long bones of the lower extremity as well as the skull are most frequently affected. Increase in the size of the head is the first symptom noted in some cases, while in others bowing of the legs, due to the effect of the bearing of weight, may develop. There may be little or no pain. Fractures may occur during the course of the disease, but usually with subsequent union.

Roentgenograms reveal the characteristic bony changes of osteosclerosis and osteoporosis. The etiology of this disease is unknown. In his original communication, Paget referred to the tendency of osteitis deformans to become malignant. The authors review the literature on this subject. The present study includes 20 cases from the Memorial Hospital, New York, and 51 from the Bone Sarcoma Registry. The association of Paget's disease and osteogenic sarcoma in both these series is 30 per cent in the former and 27.4 per cent in the latter. A patient may have had Paget's disease for many years before malignant changes develop. It is probable that there is an interval of ten to fifteen years between the final period for the onset of Paget's disease and the appearance of a complicating osteogenic sarcoma. Patients with osteogenic sarcoma and Paget's disease die about ten months earlier than patients with osteogenic sarcoma alone. The mortality rate of these combined diseases is 100 per cent. At the Memorial Hospital the treatment used in some cases has been preliminary radiation by intensive exposure to radium pack and high voltage x-rays, and, following amputation, the use of prophylactic constitutional therapy with Coley's toxins. The authors report the histories of three patients with Paget's disease of bone and osteogenic sarcoma.

G. E. LEARMONTH

Sarcoma of the Breast. Schreiner, B. and Thibeaudeau, A. A., *Ann. Surg.*, 1932, **95**: 443.

Sarcoma of the breast is a rare disease. It forms not 0.5 per cent of malignant tumours of the breast: 510 cases are reported in the literature. These tumours begin as isolated, rounded or lobulated swellings. They may be solid or cystic. Cystic forms produce very large growths.

Seven cases are reported by the authors. One occurred in a male of 77; the other developed in females ranging in age from 32 to 78 years. The average reported age is between thirty and fifty. Treatment consisted in removal of breast and post-operative high voltage x-ray treatment. Four died of intrathoracic recurrences in from two months to two and three-quarter years. One case lived nine years and died of cerebral hæmorrhage, one was alive four and three-quarters years later and one case is alive and well four months after treatment.

STUART D. GORDON

OBSTETRICS AND GYNÆCOLOGY

High Blood Pressure as an Early Sign in Toxæmia of Pregnancy. Browne, F. J., *Brit. M. J.*, 1932, **1**: 321.

In the toxæmia of later pregnancy a rise of blood pressure often precedes by a prolonged period the onset of albuminuria. During the interval between the rise in blood pressure and the appearance of albuminuria (varying in the reported cases from eleven to eighty-nine days), there are usually no symptoms or signs to suggest that the patient is in any way abnormal. There is some evidence that there may be, in the earlier stages of the pregnancy of patients who later develop toxæmia, a temporary elevation of the blood pressure which soon subsides, and which may be an expression of increased neuro-muscular irritability and of a greater tendency to vaso-constriction in such patients. The importance, for the timely diagnosis of toxæmia of pregnancy, of routine estimations of blood pressure is emphasized. When these are made, treatment can be commenced at a very early period, with the obvious advantage of minimizing the risk of eclampsia and of chronic nephritis.

The term "albuminuria of pregnancy" is a bad one, and is no doubt responsible for much of the permanent kidney damage that has in the past been a sequel of the toxæmia of late pregnancy. Its use has pushed unduly into the foreground the albuminuria, which is really a late symptom, and has therefore tended to obscure the early hyperpiesis, and has thus been the cause of dangerous delay in diagnosis and treatment.

ROSS MITCHELL

Mural Sarcoma of the Uterus with a Report of Thirteen Cases. Wolfe, S. A., *Am. J. Obst. & Gyn.*, 1932, **22**: 232.

Mural sarcoma of the uterus comprises a primary or *de novo* group and a secondary form occurring in pre-existing fibromyomas. Both are of myogenic origin and arise from orthotopic embryonal rests in the uterine wall or within the confines of a preceding fibromyoma. The mixed sarcoma of the uterus is a primary sarcoma of the teratoid type.

The degree of maturation of the component cell determines gross appearance, rate of growth and clinical malignancy of these tumours. (a) Tumours comprised of differentiated muscle cells (myoma malignum) clinically and grossly pose as fibromyomas. They are slowly growing, and rarely recur or metastasize. (b) More actively growing forms appear as spindle, fusiform and round and giant-cell sarcomas. Grossly, they are homogeneous and opaque, infiltrate relatively early, and metastasize by the blood stream. (c) Mixed sarcomas comprised of embryonal elements grow rapidly and recur promptly. Cell differentiation produces mucoid tissue, smooth and striated muscle, osteoid and cartilage; glands are of local stamp. The site of the tumour determines the clinical mode of onset. Primary sarcomas, being more frequently submucous, produce bleeding relatively earlier and more constantly than in the secondary group arising in interstitially placed myomas. Both types are most prevalent after menopause when fibroids as a rule are inactive. Diagnostic curettage will yield material for pathological diagnosis in 50 per cent of primary and secondary sarcomas. Uteri removed for supposed fibroids after the menopause require immediate gross pathological examination, to exclude sarcoma. Radical extirpation followed by post-operative radiation is indicated in growths still confined to the uterus. Palliation by radio-therapy should be the rule for advanced cases.

Prognosis, though generally grave, is surprisingly good in myoma malignum. Sarcomas arising in fibroids offer a fair prognosis, if of small size and confined within the capsular limits of the original growth.

ROSS MITCHELL

The Late Sequelæ of Eclampsia. Rucker, M. P., *Am. J. Obst. & Gyn.*, 1932, **22**: 211.

In 49 clinic cases, 37 private cases followed for at least three years, and 27 private cases who gave a definite history of eclampsia, recurring eclampsia was found in 7.5 per cent. From 16 to 27 per cent of post-eclamptic pregnancies were toxic. The yield of live births per pregnancy is somewhat less after eclampsia than normal, but this can be satisfactorily accounted for by the number of toxic pregnancies one finds at this time. Upwards of 13 per cent of the private patients were found to have hypertension. There were 4 deaths from toxæmia in post-eclamptic pregnancies and 3 deaths from cardio-renal disease in the 86 cases that were followed three years or more. More tuberculosis occurred in this group than one would naturally expect.

ROSS MITCHELL

Hysterotomy and Sterilization. Mendenhall, A. M., *Am. J. Obst. & Gyn.*, 1932, **22**: 66.

In uncontaminated cases a properly performed hysterotomy should carry no more hazards than cervical dilatation and curettage. Opening the uterine fundus early in pregnancy induces but very slight loss of blood, and a few sutures close the uterine wound securely. The uterine contents are removed by sight, leaving no doubt as to whether any tissue is left behind. The gloved finger, possibly covered with sterile gauze, is the only instrument needed inside the uterus at this operation. The cervical canal is

not, and should not be, disturbed, and infection is reduced practically to zero. Furthermore, a very high percentage of patients needing therapeutic abortion also need sterilization rather than repeated therapeutic abortions, and the abdominal route offers opportunity to sterilize.

ROSS MITCHELL

UROLOGY

Resection of the Presacral Nerve in the Painful Bladder of Interstitial Cystitis. Quinby, W. C., *Trans. Am. Ass. of Gen. Ur. Surg.*, 1931, **24**: 355.

The nervous control of the urinary bladder is a complicated mechanism. In general it is maintained by three sets of nerves. They are (1) the hypogastrics (sympathetic); (2) the pelvics (parasympathetic), and (3) the pudics (somatic). All of these nerves carry sensory as well as motor fibres, and under physiological conditions control the act of micturition. We have no knowledge of any special pain fibres or any special nervous end-organs in the bladder, therefore the perception of pain may be conducted centrally along any or all of the three varieties of nerves mentioned above. Bladder pain is probably caused by undue contraction or undue dilatation in the presence of alterations which have previously been brought about in the nerve endings in its wall, usually the result of inflammation.

The difficulty of interrupting the sensory pathways without interfering with the motor function is at once apparent, even though the anatomical approach to any or all these various nerves might be possible. It is known however that the pelvic and pudic nerves are of greatest importance, and the hypogastric nerve serves as a motor nerve to internal sphincter and trigone, and also carries inhibitory impulses to the detrusor. Loss of this nerve alone does not cause serious crippling of the bladder, hence much work has been done on section of these nerves in certain intolerable painful conditions of the bladder, particularly interstitial cystitis. There is considerable variation in the anatomical arrangement of the sympathetic nerve fibres, but in most cases the hypogastrics arise as a result of the union of fibres from the main lateral sympathetic chains on each side of the aorta. At its bifurcation or just below these fibres either unite into a single nerve lying in front of the first sacral vertebra, and, therefore, are called presacral nerve, or, in other instances, no single nerve is formed, but a plexus is found instead, made up of several such nerves having, however, the same origin in the main lateral sympathetic chains. These nerves carry the hypogastric nerves to the bladder and it is here that surgical interruption is carried out, and, though this cuts off but a small portion of the afferent impulses, definite benefit has been reported in many cases of intractable bladder pain.

The author reports a case in which intolerable cystitis had existed for a very long period and the operation had been carried out with great relief from pain, though some frequency persisted. The operative exposure was carried out through the abdomen. The anterior surface of the sacrum was exposed and a transverse incision was made through the peritoneum. By careful dissection all the tissues beneath the peritoneum and in front of the great vessels were freed and reflected upward. On each side of the common iliac artery the main sympathetic trunk was isolated and a portion about 3 cm. long excised. The vessels were entirely freed from nervous tissue as far as could be seen. In only one instance a small amount of venous bleeding was encountered and this was easily controlled.

N. E. BERRY

The Significance of Hæmaturia. Wade, H., *Brit. M. J.*, 1932, **3708**: 177.

Hæmaturia should never be regarded lightly. Thorough investigation is desirable before treatment is commenced. A careful history usually results in an accurate provisional diagnosis. Sudden, painless, profuse bleeding in one previously healthy suggests a villous papilloma of the bladder; bleeding after exercise indicates vesical calculi; bleeding in malignant disease is scanty, persistent, intermittent, and accompanied by frequency. Renal hæmorrhage may result from hypernephroma, villous papilloma of pelvis, stone; it may be the so-called "essential", and may occur as a late phenomenon of congenital multiple cystic disease. The presence in the urine of pencil clots, termed thus because of their shape, the result of being formed in the ureter, suggests renal hæmorrhage. Urethral bleeding is usually not serious, and may be due to congestion of the verumontanum.

Physical examination should be followed by cystoscopic examination. Villous papillomata of the bladder can be destroyed by fulguration through the cystoscope. Malignant tumours require open operation. If neither ureter is involved a partial cystectomy should be done; if one ureter, a hemi-cystectomy. Radium is of no value in cases involving both ureters. Transplanting of the ureters and complete cystectomy offer the only hope of relief or cure. Diagnosis of tumour cells by microscopic examination is impracticable.

STUART D. GORDON

OPHTHALMOLOGY

Ocular Metastasis of an Unsuspected Visceral Tumour. Morax, V., and Vialeix, V., *Ann. d'Ocul.*, 1931, **168**: 161.

To emphasize the point that all enucleated globes should be histologically examined, Morax and Vialeix report the following case.

Mme. B., aged 61 years, had been seen in August, 1929, when a diagnosis of right intra-ocular tumour was made. The left eye was normal. She was again seen in September, 1930, when the former diagnosis was confirmed. With the pupil dilated, a tumour of greyish-white colour could be seen, situated in the posterior part, where it seemed to occupy about two-thirds of this part of the eye. A few weeks later the enucleated eye was sent to Morax for examination. In the meantime the patient had died, 15 days after the operation, from cerebral hæmorrhage.

A histological examination was made after Zenker fixation and embedding in celloidin. For a number of reasons these slides were not examined for some months after the death of the patient, so no further clinical information could be acquired. Microscopically, the tumour was not a sarcoma of the choroid, but a very peculiar tumour of epithelial type. It occupied the whole area from the papilla to the ciliary region on the nasal half of the globe, forming between the sclera and the detached retina a mass highly coloured with hæmatoxylin, with villi-like processes. The tumour is described in further detail and the following conclusions drawn.

"In the presence of ocular symptoms, (detachment of the retina, ocular hypertension) which clearly indicates an intra-ocular growth, we must not always conclude that the tumour is a sarcoma of the choroid. Before admitting the nature of the tumour, we must assure ourselves by examination of the viscera that all other neoplasms of these organs can be excluded. On the other hand, if in the absence of all extra-ocular symptoms we have enucleated a globe, we must not neglect a histological examination of the growth which may show a hidden visceral epithelioma."

S. HANFORD MCKEE

Sympathetic Ophthalmia unassociated with Perforation or Rupture of Eyeball. Delaney, J. H., *Arch. of Ophth.*, 1931, **5**: 781.

While cases of sympathetic ophthalmia are not a rarity, a careful search of the literature fails to show undisputed cases arising without perforation or rupture of the eyeball, cases of melano-sarcoma excepted. Jackson stated that the occurrence of true sympathetic ophthalmia without traumatic rupture or perforation of the coats of the eye, and the method of its production, are still uncertain, while Butler stated, "we know that the disease follows a perforating wound of the eye, and that with the single exception of its sequence to certain intra-ocular tumours it is not associated with any other type of injury or ocular disease."

The writer reports a case of sympathetic ophthalmia caused by a blow from a snow-ball with no resulting injury to the cornea, or any perforation or rupture of the eyeball. E. C., aged 9 years was seen six days after being struck in the right eye with an icy snow-ball in November, 1929. He was under observation until January 11, 1930, and was then lost sight of. He was seen on August 15, 1930, when a diagnosis of sympathetic ophthalmia was made, and the eye enucleated and sent to the Army Medical Museum in Washington for examination. It turned out to be an indisputable case of sympathetic ophthalmia, without the usual perforation or rupture of the eyeball. This possibility should be borne in mind in all cases of traumatic uveitis.

S. HANFORD MCKEE

NEUROLOGY AND PSYCHIATRY

Adolescence and Psychological Medicine. Hall, S. B., *The Practitioner*, 1932, **128**: 169.

The unique position of the family physician in the social order leads to his being consulted upon many matters not strictly medical. Among these none are of greater importance than the multiple and multiform problems of adolescence. These vary all the way from strictly personal problems to those of serious social significance. The plea is advanced that these difficulties may only be approached and understood through personality study. "Nervous" breakdowns being essentially failures in adjustment between personality and environment, it is only to be expected that the difficult period of adolescence would be productive of many such.

To the author, personality investigation involves probing of (1) ego or instinctive tendencies; (2) temperament or pattern into which these drives are worked; (3) intelligence or innate capacity to profit from experience; (4) character or the measure of the individual's power to overcome difficulties. The storms of adolescence may be due to defects in any one of these elements or to combinations of such defects.

Following a complete physical appraisal, there must follow an investigation in each of these fields: intelligence, from consideration of the scholastic record; character, by responses to carefully thought-out questions, or by presenting a definite situation and noting the response; ego and temperament by manifestations revealed throughout the interview. Physical disease may be found, "inferiority states" uncovered, temperamental instabilities exhibited, intelligence defects or the beginnings of actual personality deviations of malignant character disclosed. With the facts accumulated much more scientific and satisfactory prognosis is possible.

Treatment is divided into three categories: (1) complete change of environment, as in transfer to a boarding school, an institution or

farm; (2) modification of environment by re-established sympathetic contact between the parties concerned; (3) treatment of the individual personality, by encouragement to face difficulties and understand problems, rehabilitation of ideals and inspiration derived from the physician himself.

A. T. MATHERS

Dehydration in Epilepsy. Cameron. D. E., *Am. J. Psychiatry*, 1931, **11**: 1.

Twelve cases of typical institutional epilepsy were studied with a view to investigating the efficacy of Temple Fay's dehydration treatment. Fay believes that if there is injury or maldevelopment of the subarachnoidal villi there will be an excessive production of cerebrospinal fluid, which may in certain cases act as a predisposing sensitizing factor (localized in traumatic cases), which would be dependent on the fluid intake and the overloading of the defective absorptive mechanism.

2. That in the presence of some disturbance of cerebral circulation there would be increased intracranial pressure with further transudation of fluid, resulting in stretching of the arachnoid and traction, due to arterial pulsation, all these factors acting as subminimal stimuli which, summated, might produce the final motor discharge.

3. That by limiting the fluid intake the production of cerebrospinal fluid might be confined within the limits of the defective absorptive mechanism and thus this predisposing factor be eliminated.

Working from this theory Cameron makes the following assumptions. (1) If the fluids be reduced then the number of attacks should be reduced; (2) increasing the quantity of fluids again should increase the number of attacks over those observed in dehydrated period; (3) that where fluids are increased, even in the absence of previous dehydration, the number of attacks should be increased, or, at least, there should be some increase in the signs of increased intracranial pressure, *e.g.*, headache.

The author then studied the results of dehydration on 12 typical epileptics and found that (1) On a strict diet with the fluids limited to 600 to 1,200 c.c. no cases showed a constant reduction in the number of attacks; some showed an actual increase and others a wide variability apparently independent of dehydration; (2) the above results being unsatisfactory, the patients were given unlimited fluids and again there was no constant result; no case showed a definite increase in the frequency of the attacks; (3) there was no evidence of any increase in signs of increased intracranial pressure.

The author concludes that 2 patients out of the 12 showed some improvement in disposition, but that others became more irritable and more difficult to manage. Five patients showed severe signs of nitrogen retention while on restricted fluids, with a blood urea-nitrogen of 40 and up, and in several cases there was a marked loss of weight with a lowered resistance to infection.

On the basis of these findings the author, while admitting that the number of cases is very small, feels that dehydration is of no value in the treatment of epilepsy.

G. N. PATERSON-SMYTH

PATHOLOGY AND EXPERIMENTAL MEDICINE

Spontaneous Peptic Ulcers of the Duodenum after Continual Loss of Total Pancreatic Juice. Elman, R. and Hartmann, A. F., *Arch. Surg.*, 1931, **23**: 1030.

In a former article (*Arch. Surg.*, 1930, **20**: 333) which was reviewed in this *Journal* (1930, **22**: 733) Elman and Hartmann mentioned the finding of duodenal ulceration in a dog that lost the entire external secretion of the pancreas and was kept alive for two weeks with daily intraperitoneal injections of Ringer's solution. Following this observation, a number of dogs were similarly experimented on and in each duodenal ulcers developed. A study of the factors that keep a duodenal ulcer from healing is even of more importance than the actual production of the ulcer. It has been often shown that the mucous membrane of the stomach has a remarkable regenerative power so that following the removal of large areas of mucosa there is complete healing in about two weeks' time. Duodenal ulcers also heal spontaneously but may recur and heal again due to several causes. Among the factors which promote chronicity are high acidity and roughness of the gastric contents. Duodenal ulcers seldom if ever occur in dogs unless induced experimentally, so that they are well suited for this line of research work. The method employed by Elman and Hartmann, was the intubation of the main pancreatic duct in dogs, so as to obtain the total pancreatic secretion under sterile conditions and for the entire twenty-four hours. From such drainage death soon ensues but in the present experiments life was maintained by the daily intraperitoneal injection of 500 c.c. of "combined solution" in 5 per cent dextrose. Under aseptic precautions pancreatic juice was collected each day, and by culture or by examination of a centifugated specimen the presence or absence of infection was determined. On the occurrence of infection the animal was chloroformed and an autopsy performed. Drainage was kept up for at least thirteen days in the present experiments. Autopsy was performed at once at the end of the experiment. The main chemical constituents of the blood were frequently analyzed.

In each of the six dogs studied a large ulcer was found just beyond the pylorus on the posterior or superior aspect of the duodenum. In some of the dogs one or two smaller ulcers were noted a few millimetres distally. The stomach showed no abnormalities. The authors concluded that they were dealing with a definite mechanism capable of producing peptic ulcers of the duodenum. In some unknown way the pancreatic juice protects the duodenum and its absence brings about spontaneous peptic ulcers. Observations made by several investigators tend to explain the correlation between duodenal ulcerations, high gastric acidity and hyperactivity of the pylorus. High gastric acidity in patients with duodenal ulcer is explained by the diminished reflux of pancreatic juice due to increased pyloric tone. Pylorospasm, by diminishing duodenal reflux, promotes a high gastric acidity, which may be the only factor necessary to prevent mechanical or other erosions from healing or developing into a peptic ulcer. *Per contra* a pyloric ulcer induces spasm which in turn promotes hyperacidity, leading to a vicious circle and progress of the lesion.

The importance of the pylorus in the treatment for duodenal ulceration lies partly, because of its effect on the control of gastric acidity. To prevent pylorospasm operations have been devised, so that by removal of part of the muscle pylorospasm may be prevented.

G. E. LEARMONTH

HYGIENE AND PUBLIC HEALTH

The Present Status of BCG Vaccination. Petroff, S. A., *New Eng. J. Med.*, 1932, **206**: 436.

No problem in tuberculosis, since the famous controversy on the entity of bovine and human tuberculosis some twenty-five years ago, has created such feverish discussion among the students of tuberculosis and public health specialists as the prophylactic immunization against tuberculosis advocated by Professor Calmette, of the Pasteur Institute, known as the BCG (Bacillus Calmette-Guérin) vaccination.

With the discovery of the tubercle bacillus and with the demonstration of various immunological and humoral antibodies it became the ambition of every investigator to devise some method of prophylactic immunization against tuberculosis. In 1908, Doctors Calmette and Guérin isolated a tubercle bacillus from a calf. At the time of isolation, it was pathogenic for guinea pigs, rabbits, horses and cattle. After five years' cultivation on a glycerin potato bile medium it lost its pathogenicity for all laboratory animals. As the dosage of a spontaneous infection in childhood cannot be controlled, it has been suggested that an organism of fixed characteristics producing non-progressive disease may be ideal as a vaccine for prophylactic immunization. Professor Calmette claims that his culture is most suitable for the purpose, because, once inoculated into babies, it establishes a non-progressive focus in the lymph-nodes, thus producing immunity.

In 1924 Petroff obtained his first culture of BCG from Ottawa. In a series of guinea pigs inoculated with this culture he found that a small number of animals developed progressive tuberculosis. The results were contradictory to those of Calmette. The author's second culture was brought from Paris by Dr. Lawrason Brown, and the third culture he obtained directly from Professor Calmette. With the second and third cultures, he observed typical progressive tuberculosis in about 2 per cent of the guinea pigs which had been inoculated subcutaneously or intraperitoneally. From these studies he concluded that BCG was an organism of low virulence, producing tuberculous changes which had a tendency to heal. But in a number of animals which had been under observation for about eighteen months progressive tuberculosis developed. The author believes that it is the variant produced by culture which is pathogenic, and that the dissociation phenomenon can explain the instability of the organisms; he believes that no microörganism is stable.

In France alone, hundreds of thousands of babies have been vaccinated by this method, but out of the wholesale vaccination there are records of only 6,820 babies and they have not been very carefully observed. Calmette, presenting the follow-up of 6,820 babies, does not mention how many react to tuberculin. Attention is called to the criticism of Calmette's statistics by such men as Greenwood, Rosenfelt, Götzl and others, who, after analyzing them, concluded that they are valueless.

None of the vaccinated babies can be compared with the controls, because they have been selected. The vaccinated babies have all been isolated from four to six weeks, thus preventing an exogenous infection; such an isolation allows time to develop a natural resistance. The controls have never been isolated, as soon as they are born they come in contact with infection from the parents long before they develop a normal resistance. During the first few months they become infected and many succumb to disease.

A careful study was made by van den Bergh of two groups of expectant mothers, one group which had tuberculosis was known to the dispensary. They were told what precautions to take after the birth of the baby. The second group consisted of expectant mothers who were

not known to the dispensary and were not aware of the danger to the new-born babies. In the first group the mortality of the babies from tuberculosis was very low, while in the second group it was rather high. It seems that sociological measures play a very important part in any preventive campaign.

At present there are no statistics showing that the controls have been submitted to the identical régime of education and isolation as the vaccinated babies. So the two groups cannot be correlated.

Petroff goes on record as against the use of living virus as a vaccine, especially in this case where the organism has been attenuated. There is not an iota of scientific evidence to show that the babies vaccinated with BCG will not in time develop clinical tuberculosis. No living organism is stable; to-day it may be non-virulent, but after passing through a suitable environment it may regain its virulence and in time become a menace to the person who has been vaccinated.

LILLIAN A. CHASE

RADIOLOGY

The Diagnostic Value of Prepyloric and Pyloric Roentgen Findings. Stone,. R. S. and Ruggles, H. E., *Am. J. of Roentgenol.*, 1932, 27: 193.

Correct interpretation of roentgenological findings is based on a knowledge of the anatomy, physiology and pathology in the given area under study. The anatomy of the pyloric region is given briefly and it is admitted that the physiology of this region is still debatable in the light of our present knowledge. The abnormal conditions are grouped into five divisions as follows and illustrative case histories are given.

1. A wide pyloric canal, or one normal in diameter which fails to close properly, is usually due to abnormal relaxation of the sphincter, the result of reflex stimulation of the nerves or a lowering of the gastric gradient. This finding is not diagnostic, but it is a warning signal of disease elsewhere. It is found in pernicious anæmia, achlorhydria, intestinal obstruction, duodenal ulcer and infiltration with carcinoma or lymphosarcoma.

2. A narrow or apparently absent pyloric canal is a frequent finding, due to (a) pathological function as in achalasia or pylorospasm. Achalasia is a failure of the pyloric sphincter to relax on the approach of a peristaltic wave, caused by some reflex mechanism resulting from any visceral sensory nerve irritation. It is found in many conditions—peptic ulcer, cholecystitis, appendicitis, pancreatic disease, urinary colic, hysteria, etc. Pylorospasm is due to a more direct irritation of the pyloric muscle. (b) Pathological lesions, including infiltration of the area by growth, fibrosis of the walls with contraction, peripyloric adhesions or to hypertrophy of the muscles of the pylorus. In this relation there is a very definite hypertrophic pyloric stenosis of adults, sometimes having a congenital origin, or, again, it may be due to long continued reflex spasm. The methods of differential diagnosis are discussed.

3. Elongated pyloric and immediate prepyloric deformity. This condition is practically always apparent rather than real. Spasm is here also a frequent cause of this deformity. Carcinoma of the prepyloric region presents the most serious diagnostic problem. Fibrosis in the same area and syphilis affecting the distal portion of the stomach are real difficulties in differential diagnosis. The text describes helpful aids in diagnosis.

4. Eccentric pylorus may be due to oval pyloric canal ulcer adjacent to pylorus, adhesions or inflammation causing contraction of muscularis mucosæ.

5. Irregularities of the pyloric canal walls are almost always due to ulcer.

It has been shown that practically no pyloric or small prepyloric deformity is characteristic of a definite disease or lesion. Close correlation of the other x-ray and clinical findings is necessary to arrive at a correct diagnosis. Spasms in particular can simulate all other lesions and then do not always behave as they theoretically should.

A. STANLEY KIRKLAND

Obituaries

Dr. Ainslie Power Ardagh, of Orillia, died on March 11, 1932. He was a graduate in medicine of Trinity University (1890). He held the diplomas of L.R.C.P. and L.R.C.S. (Edin.), and L.F.P.S. (Glasgow).

Dr. Arthur Burridge, Associate Professor of Medicine, University of Manitoba, died on March 15, 1932, at his home in Winnipeg, after a short illness. He was born at London, Ont., on March 28, 1875, but the family moved to Winnipeg a year later. He was educated in the public schools of Winnipeg, Wesley College, where he graduated B.A. at the age of eighteen, and Manitoba Medical College, gaining his medical degree in 1897 at the age of twenty-two. Post-graduate work in London, Berlin, Vienna and the Johns Hopkins Hospital at Baltimore gave him a wide knowledge of medicine and in 1912 he was appointed Lecturer in the Medical College. In 1919 he became Associate Professor of Medicine in the Faculty of Medicine, University of Manitoba. For many years he was a member of the Honorary Attending Staff of the Winnipeg General Hospital, where he was recognized as an expert in cardiac diseases and was widely consulted. He was a Fellow of the American College of Physicians, and also took a keen interest in the local medical societies. His widow and four sisters survive him. Thoroughly versed in internal medicine, possessed of authoritative knowledge on heart diseases, a loyal colleague, and a good companion, he will be greatly missed.

ROSS MITCHELL

Dr. Isidore Mordecai Cherniak, of Windsor, Ont., died on March 16, 1932, at Harper Hospital, Detroit. He had been ailing five or six weeks. He is survived by his widow, Sarah, and two children, William B. and Cyrille V., in addition to four brothers and one sister, all of Windsor. His brothers are all well-known local merchants, Nathan Cherniak, Samuel Schwartz, Jacob Schwartz and David Schwartz. Cherniak is the family name, but three of the brothers adopted the name of Schwartz.

Dr. Cherniak held the M.D. degree of Detroit College of Medicine (1917), and of the University of Western Ontario (1918).

Dr. Hobert LeGear Collins, of New Westminster, B.C., passed away on February 26, 1932, at the Royal Columbian Hospital. He suffered a stroke in August of last year, resulting in a lingering illness.

The deceased was born in Kincardine, Ont., fifty-three years ago. He graduated from the University of Toronto (M.B., 1900) and commenced the practice of medicine in that city, later removing to Edmonton. At the outbreak of the Great War Doctor Collins offered his services to the Canadian Army Medical Corps, and served with distinction with several front line units. Later he acted on the staff of field and base hospitals.

At the close of the war he returned to Edmonton, where he associated himself very closely with the Great War Veterans' Association, and later with the Canadian Legion. He was president of both these organizations. It was under his guidance that the Edmonton Memorial Hall was built.

Coming to New Westminster in 1923, Doctor Collins immediately identified himself with the work of the Canadian Legion. He took a keen interest in sports of all kinds. He was a life long Conservative, a member of the Masonic fraternity, of the Kiwanis and Elk Clubs, and of the Vancouver Golf and Country Club. He established for himself a place from which he will be greatly missed. He is survived by his wife and one son.

W. A. ROBERTSON

Dr. J. H. Edmison. One of the most popular physicians in Manitoba, Dr. J. H. Edmison, a member of the Manitoba Legislature, died at his home in Brandon on March 22, 1932, at the age of 57. He was born at Watertown, Ont., the son of the Rev. Henry Edmison, and was educated at Owen Sound, Queen's University and the Manitoba Medical College, from which he graduated in 1898. He practised at Dunrea, Manitoba, until 1908, when he moved to Brandon, where he acquired an extensive practice. He was on the staff of the Brandon General Hospital, and, in 1931, was President of the College of Physicians and Surgeons of Manitoba. He entered public life as an Independent in the Provincial elections in 1922 and was re-elected in 1927.

He is survived by two sons and two daughters. One of his sons is an intern in the Winnipeg General Hospital.

Dr. Joseph Morley Jory, died at his home in St. Catharines on March 21, 1932. He was one of the best known physicians in the Niagara district and had taken a prominent interest in public affairs, having served for years as an alderman and a member of the Board of Education. Though in failing health for the past six months, he was not confined to his bed until a week before his death. Doctor Jory was born sixty-four years ago at Norwood, Ont., and came to St. Catharines thirty-five years ago. He served as a captain in the Canadian Army Medical Corps in the Boer War. In his younger days he was an expert lacrosse player. Doctor Jory graduated from Trinity Medical School (1894). His widow, Alice, two daughters and a son survive, Gwendolyn at home and Mrs. Stewart Robertson and Donald Jory, Toronto.

Dr. Thomas Lovell McRitchie, of Chatham, Ont., died at his home on March 19, 1932, after a short illness.

Doctor McRitchie who was in his seventieth year, was born at New Scotland, Harwich Township, the son of the late Mr. and Mrs. A. McRitchie. After completing his education in the district schools he entered the London Normal School and became a teacher, holding positions in Dover Township, St. Catharines and Hamilton. Entering the Western Medical School in London, he graduated in 1889, and associated himself with the late Doctor Fleming, of Chatham, for a short time. He then returned to his native township and established himself at McKay's Corner, where he built up an extensive practice. In 1910 he moved to Chatham, and a few years later he was appointed Medical Officer of Health for the city and a Coroner of the district.

Doctor McRitchie took a keen interest in public affairs. He was a former President of the Kent Conservative Association. Notwithstanding his extensive practice in the city, he found time to devote to public affairs and served on the Board of Education, part of the time as Chairman. He was also a former alderman. He was an outdoors man and a great friend of amateur sport.

Surviving are: one daughter, Mrs. W. George Kerr of Chatham; three sisters, Mrs. (Dr.) D. K. Stenton of St. Thomas, Mrs. Isaac Montgomery of Chatham and Mrs. J. Fletcher of London; and three brothers, David of Alberta, Alexander of Arthur, Ont., and Albert, of Ridgetown.

Dr. Frank Merton Robertson Spendlove, for many years associated with the Western Hospital, Montreal, died on March 22, 1932, after a short illness. He was 77 years of age.

Doctor Spendlove was born near Magog in 1855. He graduated from Bishop's College, Lennoxville, with honours in medicine and set up a practice in Magog, remaining there for some years before coming to Montreal.

He was head of the out-patient department of the Western Hospital for a number of years. Then he retired to private practice once more, with strong leanings toward vegetarianism and hydrotherapy. He knew the effects of many foods now noted for their vitamin content and was one of the pioneers in the field of nutrition. For some time, he was associated with the late Dr. D. B. A. McBean. He was deeply interested in mysticism and a worker in the cause of more liberal religion.

Surviving are his widow, Roberta A. Harrower, one daughter, Saidai Frances Spendlove, Montreal; and three sons, Robert M., Montreal, John R., Bruges, Belgium, and F. St. George, of Washington, D.C.

Dr. James Giles Robinson Stone, of Windsor, Ont., x-ray specialist and a veteran of the Great War, died suddenly at his home, Windsor, on April 2, 1932, two hours after he returned home from his office. Death was caused by heart disease. Doctor Stone, who was a son of the late Rev. Samuel Stone, editor of the *Christian Guardian* of the Methodist Church for many years, was born in British Columbia. He enlisted in the British Northumberland Fusiliers for the Great War and later was transferred to a hospital unit. He came to Windsor fifteen years ago, after being discharged with the rank of Captain. He leaves his wife, Mrs. Helen Stone; four brothers, Hiram, of Parry Sound; Bidwell C., of the Royal Bank staff of Toronto; George, Principal of the Sault Ste. Marie Collegiate Institute; and Ralph, of Toronto; and two sisters, Mrs. Thomas B. Hawkins, of Ottawa, and Mrs. Richard Schnnackey of Middleton.

Dr. Henry Thomas Hadley Williams died from coronary thrombosis on February 23, 1932.

Doctor Williams graduated from Western Ontario University Medical School in 1888, joined the Medical Faculty as Demonstrator of Anatomy, and in 1900 began teaching clinical surgery. In 1909 he was made Professor and Chief of Clinical Surgery, a position he held until his death. His students remember him as a skilled surgeon and as an inspiring teacher. He used effectually his knowledge of comparative anatomy to illustrate many surgical problems and the sketches that he could make so readily on the blackboard were most helpful to his students.

Doctor Williams was born in Devon, England, in 1864, coming to Canada in his youth. After graduation from Western University he took post-graduate work in England and qualified for the degree of F.R.C.S. (Eng.). The American College of Surgeons conferred upon him the honorary degree of F.A.C.S. and Western honoured him in 1929 with the degree of LL.D.

During the Great War he served as M.O. of the Orpington Hospital in England, with the rank of Lieutenant-Colonel.

Doctor Williams was the founder and first Life Member of the Alumni Association of Western Ontario and was keenly interested in its development. The undergraduates showed their appreciation of him by electing him Honorary President of the Hippocratic Society, the highest honour that they can bestow upon a member of the faculty.

In 1905 he married Miss Elsie Perrin who survives him, as do also a sister, Mrs. Cowan, of London; and a brother, H. B. Williams of Phoenix, Ariz.

Dr. A. Bruce Macallum, dean of the Medical School, and perhaps more closely associated with Doctor Williams than any other official at the university, said: "The passing of Dr. Hadley Williams removes an outstanding senior member of the faculty of medicine and one whose personal efforts and sacrifices have consolidated the medical department of the University of Western Ontario. He created a highly successful professional career and was a brilliant and inspiring teacher who personified to hundreds of graduates the best the profession had to offer them."

News Items

Great Britain

Retirement of Dr. Cox.—As most of our readers doubtless know, Dr. Alfred Cox is retiring from the post of Medical Secretary of the British Medical Association at the Centenary Celebration next July. He will be succeeded in office on October 1st, next, by Dr. G. C. Anderson. Dr. Anderson became Deputy Medical Secretary in 1919, and when he moves up this position will be filled by Dr. Robert Forbes.

The Osler Club.—At a meeting of the Osler Club held in London on March 24, 1932, Sir Robert Philip, LL.D., Professor of Tuberculosis in the University of Edinburgh and Hon. Physician to the King in Scotland, gave an address on "Robert Koch's discovery of the tubercle bacillus: some of its implications and results." A vote of thanks to the lecturer was proposed by Dr. W. G. Willoughby, President of the British Medical Association, and seconded by Dr. William Stobie, Mayor of Oxford. The following took part in the discussion: Dr. A. S. MacNalty, Senior Medical Officer of the Ministry of Health, Dr. R. A. Young, Sir Henry Gauvain, Prof. Leonard Findlay, Dr. George Hurrell, Tuberculosis Medical Officer for Newcastle-on-Tyne, and Dr. A. P. Cawadias.

East London Children's Hospital. — A series of monthly lectures on medico-historical topics has recently been conducted at the East London Children's Hospital, to which the medical and nursing staff of other hospitals were invited. The first address was given on January 29th by Mr. W. R. Bett, who spoke on "The drama of appendicitis: the stage and the actors", with Mr. Wilfred Trotter, Sergeant-Surgeon to the King, in the Chair. On February 12th, Sir D'Arcy Power gave a lantern lecture on "Some portraits of English surgeons", and on March 11th, Sir Percival Horton-Smith Hartley presided at a symposium on "Robert Koch: the man, the years, the harvest". The speakers included Sir Henry Gauvain, Dr. A. S. MacNalty, of the Ministry of Health, Dr. Harley Williams, of the National Association for the Prevention of Tuberculosis, and Mr. W. R. Bett.

Alberta

The sum of $1,500,000 will be spent this year by the Provincial Department of Health. This is a reduction of $100,000 under the amount of last year. The Travelling Health Clinic will not be in operation this year, which will mean a saving of $30,000. Among the items in the budget for health work are Ponoka Mental Hospital, $391,000; Red Deer Training School for the Feebleminded, $76,443; Oliver Mental Institute, $118,274; Public Health Nursing Branch, $48,820; Provincial Sanatorium for tuberculous patients, $219,450; grants (per diem) to general hospitals, $400,000. In 1921 there were 187 permanent Public Health officials but in 1931 there were 466.

The medical department of the University of Alberta provided a "refresher course" to members of the profession over a period of five days commencing May 16th. Clinics were given at the University Hospital at Edmonton in medicine, surgery, gynæcology and obstetrics, dermatology and venereal diseases.

Once more the question of hospital aid to indigent residents of municipalities has been brought up for judicial decision, on this occasion before three judges of the Alberta Court of Appeal. Two patients had received treatment in one of the large general hospitals and the question of payment came before a trial judge who gave judgment in favour of the hospital for the first patient, and in the second no allowance was made for the expense of operation or convalescence. The trial judge held that both patients were indigents on admission to the hospital and residents of the districts. The municipal district cross-appealed against that part of the judgment which held that it was liable for both accounts and denied its costs of the action.

One of the Appeal Court judges stated that nowhere in the Municipal Acts is there any statutory obligation cast upon a hospital to provide care and treatment of the indigent sick, this obligation having been placed on the local authority only, but subject to certain restrictions. The legislature having fixed this limitation upon the liability of the municipal district in the case of an indigent sick person admitted to a hospital, it would appear unreasonable to read into the section such a meaning as would enable a hospital official in the absence of authorization to create a liability against the municipal district under emergency circumstances merely by the issues of his certificate.

One of the other judges remarked that "it may be argued with equal force, that it is a hardship upon the local authority, that they should under any circumstances become liable to hospitals that are employed to care for indigent sick, without the knowledge of the councillors, and perhaps contrary to their considered policy of having nothing to do with these particular hospitals.

So long as this language remains in the statute the court can but give its best judgment as to what the intention of the lawmakers was. It is of course open to the legislators of this province to declare by Act amendment, precisely what they do intend, and so put an end to controversies over language which, with great respect, I can only describe as vague, uncertain, and ambiguous. Where the machinery of arbitration, statutory or otherwise, has broken down, the courts have always exercised the right of intervening on the ground that the matter cannot be left up in the air, on the principle that where there is a wrong there should be a remedy. In the case at the bar so far as the record shows this section has simply been ignored by the parties to the action. The appeal of the hospital was dismissed and the cross appeal of the municipality was allowed.''

The annual report of the federal Department of Indian Affairs was recently published and deals with Indian Health Supervision during the year 1931. Vaccination is being carried out in Indian schools and it is anticipated that the rising generation of Indians will be effectively protected against small-pox. According to the report of Dr. J. J. Wall, the federal eye-specialist, trachoma is prevalent among the Indians of Saskatchewan, Alberta, and British Columbia, and exists to some extent in Manitoba. Due to the fact that the federal Department's Indian residential school recruits pupils from wide areas there is a danger that children from reserves where trachoma does not exist may contract it and take it back to their homes. The trachoma problem is one of exceptional importance both to Indians and white people. Instructions have been issued for preventive treatment of residential school pupils, but it is realized that much more vigorous measures are required. At least one travelling eye-clinic should be set up to instruct local health personnel in the prevention and treatment of this disease. The situation is likely to grow more serious and the final solution more costly.

It is interesting to note in this report that there are 5,000 Indians in Canada suffering from active tuberculosis and capable of transmitting the disease to other people. In passing it may be said that the incidence of this disease in Alberta is not high and all cases are kept under careful supervision. According to the report a sum of less than $150,000 cannot be expected to have much effect on the tuberculosis problem at large. The Department has plans prepared for attacking this disease more effectively, but has not at the present time financial means to carry them into effect. The remedy is in the hands of the public which in the last analysis has to suffer the menace of tuberculosis groups within its more healthy communities. The writer of the report divides the Indians into two classes: (1) the agricultural class among whom it would not be impossible to stamp out tuberculosis on several reserves and at not a very large cost. (2) The roaming class among whom there is not much hope for improvement in those suffering from tuberculosis. The number of bands in this group may be reduced to remnants of their present numbers.

G. E. LEARMONTH

British Columbia

It is definitely announced from Victoria that no legislation covering health insurance will be introduced at present. The advocates of the measure state that they will continue to work upon plans for a beginning in a modest way, leaving a more comprehensive and consequently more expensive program till economic conditions are more favourable.

A residence on Hornby Street in Vancouver, which has come into the possession of the Crown, is being fitted up as a first unit in a psychiatric clinic, under the direction of the Provincial Mental Hospital.

The annual meeting of the British Columbia Graduate Nurses' Association was held in Vancouver on March 29th. A feature of the meeting was an address by Dr. G. M. Weir, director of the Canadian Nursing Survey. He stated that there are at present 12,000 unemployed nurses in the Dominion. Recent investigation of pupil nurses had shown a mean of intelligence five points below the average for elementary teachers. In selecting pupil nurses, character and capacity, rather than wealth and social position, should be the criteria. In his opinion the future will see a university degree replace high school education as the educational qualification in entering upon the nursing profession.

A private bill to legalize the practice of chiropractic was withdrawn in the Legislature recently, when the Speaker ruled that certain clauses could only be considered when forming part of a government measure. It is stated that another bill will be introduced but the fact that the government is not sponsoring the matter is regarded as of significance.

A link with the past is being severed, in Vancouver, with the demolition of the old south wing of St. Paul's Hospital. This building, which was erected in 1894, was the first unit of the hospital, and its passing is another evidence of the healthy growth of the institution.

The British Columbia Medical Association will meet this year in Kelowna, on May 26th to 28th inclusive. The place of meeting affords unusual opportunities for social recreation, and an excellent scientific program is being prepared.

Through the courtesy of the Sun Life Assurance Company the annual post-graduate course of lectures began on May 23rd at Cranbrook; the lectures taking in the interior, Vancouver and New Westminster, the Island, and Prince Rupert and Prince George in the north.

C. H. BASTIN

Manitoba

Dr. A. T. Mathers, Dean of the Faculty of Medicine, University of Manitoba, and Dr. P. H. T. Thorlakson made a two weeks' tour of Alberta under the post-graduate scheme of the Canadian Medical Association. Dr. E. J. Boardman was to have accompanied Dr. Mathers but was obliged to return on account of illness.

Dr. William Boyd, Professor of Pathology, University of Manitoba, and Pathologist to the Winnipeg General Hospital, has been recommended as a Fellow of the Royal College of Physicians, London.

The annual Lister Day celebration was held at the Medical College, Winnipeg, on April 5th. Dr. B. J. Brandson, Professor of Surgery, occupied the Chair and introduced to the audience Mr. H. B. Mitchell who, sixty-four years ago, had been treated by Mr. Lister, as he then was, for a compound fracture of the leg. Mr. Mitchell gave his memories of the great surgeon, emphasizing his human side. Dr. O. Bjornson related a visit he had paid to Lord Lister in London in 1902 for the purpose of securing his autograph on a large picture of Lister donated to the Winnipeg Medical Society by the late Dr. R. J. Blanchard who had been one of Lister's housemen.

Dr. W. A. Gardiner gave the Lister oration. He referred to the great men in the history of surgery

and pointed out how Lister was indebted to them and at the same time went beyond them and was able to relieve mankind of untold suffering.

The Winnipeg Medical Society held its regular monthly meeting on March 17th, commemorating the fiftieth anniversary of the discovery of the bacillus tuberculosis. The papers were: "Robert Koch, the man and his work," Dr. D. A. Stewart; "Bacteriology and immunology," Dr. F. T. Cadham; "Diagnosis—fifty years ago and now," Dr. E. L. Ross; and "Treatment—fifty years ago and now," Dr. B. H. Olson.

The annual report of the Sanitorium Board of Manitoba, just issued, shows that Manitoba has a provision of 685 beds for the treatment of tuberculosis. The travelling clinics during the year held 23 clinics and examined 2,634 persons. The Manitoba Sanatorium at Ninette received Class "A" standing from the American College of Surgeons.

The Central Tuberculosis Clinic in Winnipeg was opened in October, 1930, and during its first year 1,626 individuals sought its services. It has recently been enlarged to make provision for the examination and supervision of children who have been in contact with the disease. The death rate in the province last year was 64.7 per hundred thousand population.

At a conference held recently between representatives from the hospitals, the Manitoba Medical Association, and from the Manitoba Underwriters Association, an agreement was reached whereby insurance men will try to secure payment to hospitals and medical men for services rendered in connection with illness or accident when insurance claims for same are being paid.

ROSS MITCHELL

New Brunswick

At a meeting of the College of Physicians and Surgeons of New Brunswick, on March 8th, the regulation for registration in Medicine in New Brunswick was changed, so that all medical students registered with the Provincial Council will, on the completion of their medical course, be obliged to qualify for medical registration by passing the examinations of the Medical Council of Canada.

Officers of the Council for the following year are: *President*, Dr. G. Clowes VanWart; *Treasurer*, Dr. G. A. B. Addy; *Registrar*, Dr. S. H. McDonald.

The new pædiatric service in the Saint John General Hospital is staffed by two senior appointees, namely, Dr. Stanley Bridges and Dr. D. W. P. Porter.

Recent R.C.A.M.C. appointments include the name of Dr. A. B. Walter, of Saint John, to be Lt.-Col., commanding No. 14 Field Ambulance, replacing Lt.-Col. C. M. Pratt, M.D., who was transferred to his original unit.

The New Brunswick Workmen's Compensation Act has been much to the fore at the recent meeting of the local legislature. During the discussions there was some criticism of medical fees being too high. This was denied by Dr. J. Alex. Bell, President of the New Brunswick Medical Society, following a meeting of the Executive held in Moncton on March 18th.

It was announced from Fredericton on March 22nd that a bill providing for a 25 per cent cut in the provincial contribution for the maintenance of patients in tuberculosis sanatoriums was introduced. This bill was subsequently passed and it will mean that the province will pay 75 cents instead of $1.00 per patient per day for the duration of his stay in the sanatorium.

Dr. Wm. Warwick, Deputy Minister of Health, in his report to the Minister of Health, presented at Fredericton on March 10th, states that regarding notifiable diseases, the record of the last year is a matter for congratulation to the Minister of Health. This year there was not a single case of small-pox, while in previous years it was very prevalent and costly. Diphtheria showed a decline in the number of cases. There were 100 cases of typhoid with 13 deaths, giving 3.1 deaths per 100,000 of population. These figures are the best on record for the province.

The monthly report of the Saint John Tuberculosis Hospital stated that their capacity was now completely attained. There is a small waiting list. There is accommodation for 212 patients.

The New Brunswick birth rate showed a slight increase over the last two years, being 24.9 per 1,000 population. Births registered were 10,534. The death rate has declined to a new low level, being 11.8 per 1,000 population as compared with 12.5 in 1929. The total deaths were 4,991.

For the month of February, Fredericton, N.B., enjoyed 147 hours of sunshine, more than any other place in the Dominion where records are kept. Saint John had 140 hours, ranking fourth in the Dominion. This is contrary to the usual idea which ascribes to New Brunswick a constant state of fog.

For the last month or six weeks influenza, or "la grippe", has been very prevalent throughout New Brunswick. The number of cases of pneumonia has been rather unusual and the number of deaths has been sufficient to cause alarm. Blood-spitting early in the course of the disease is a prominent feature, associated with marked prostration. There also appear to be an unusual number of sequelæ in the way of pleurisies, empyemas and especially the malignant type of mastoiditis. Most of these cases of mastoiditis show streptococcus infection. The visiting privileges of the Saint John General Hospital have been temporarily restricted on account of this epidemic.

Dr. C. M. Kelly is spending a month doing postgraduate work in New York.

Dr. R. J. Collins has returned from Montreal where he attended a number of clinical lectures on surgical tuberculosis.

Dr. F. A. McGrand, of Welsford, has resumed his practice after a month of special work at Harvard University.

A. STANLEY KIRKLAND

Nova Scotia

The Halifax Medical Society at its meeting on March 9, 1932, held a symposium on the thyroid gland. The subject was introduced by Dr. E. W. H. Cruickshank, Professor of Physiology, Dalhousie University. He spoke on the chief items of interest from the physiological standpoint. Dr. Kenneth MacKenzie discussed the medical aspects, and Dr. Harry O'Brien spoke on the surgical aspects.

The government of Nova Scotia is giving serious attention to the health of the people. The Minister of Health, Hon. Dr. G. H. Murphy, introduced "measures to permit action by the Department of Public Health to promote the welfare of residents of the province." "Payments of $1.00 per day for patients treated in tuberculosis annexes which have already been con-

structed by local hospitals, with the prospect of more developing during the year, is legalized under the bill amending the Local Hospitals' Act.'' Provision is also made for the proposed Provincial Nursing Staff.

The Dalhousie Health Clinic continues its good work. Attendance for February totalled 2,142, of which 996 were in the department of genito-urinary diseases.

The Halifax branch of the Victorian Order of Nurses is to be congratulated on its splendid record. This branch is the only one with its own home, fully paid for. Her Excellency, Lady Bessborough, on her recent trip, paid a visit to the building and expressed her appreciation of the work done.

The Dartmouth Ferry Commission has forwarded a resolution to the Dartmouth Town Council asking for a grant of $300 for the Victorian Order of Nurses. The Ferry Commission feels that it indirectly benefits from the services of the Victorian Order of Nurses.

N. B. DREYER

Ontario

At the recent session of the Legislature for the Province of Ontario, a bill was passed amending the Ontario Medical Act. The following are the main points covered in the amendment:—

1. Territorial representation on Council reduced from 18 to 10; homœopathic representation on Council reduced from 5 to 1; university representation on Council reduced from 6 to 3. This eliminates three representatives now sitting,—one from Trinity College, one from Victoria University, and one from the University of Ottawa.

The Minister of Health for Ontario becomes a member of Council. Council will now consist of 15 members instead of 29.

2. Council elections are to be held quadrennially, as before, the next election being in October, 1932. The present Council acts until the new elections. The Act comes into force on July 1, 1932.

3. Penalties for violation of the Ontario Medical Act have been increased up to a maximum of $500 for second and subsequent offences; while a penalty for second offence up to $200.00 is provided for a person convicted of posing as ''Physician'', ''Doctor of Medicine'', ''Surgeon'' or ''General Practitioner''.

In reference to diagnosis, the words ''physical defects'' have been included in ''ailments'', which strengthens that clause in the Act.

No person shall be entitled to recover any charge in the Courts for medical or surgical advice, unless registered under the Ontario Medical Act.

4. The new territorial divisions are as follows:—

1. Essex; Kent; Lambton; Elgin.

2. Middlesex; Norfolk; Oxford; Perth; Huron.

3. Bruce; Grey; Dufferin; Waterloo; Brant; Wellington.

4. Haldimand; Welland; Lincoln; Wentworth.

5. Simcoe; Halton; Peel; York; Ontario; Durham; Victoria.

6. Peterborough; Northumberland; Prince Edward; Hastings; Lennox and Addington; Frontenac; Renfrew; Leeds.

7. Lanark; Grenville; Carleton; Dundas; Stormont; Glengarry; Russell; Prescott.

8. Haliburton; Muskoka; Parry Sound; Nipissing; Temiskaming; Sudbury; Algoma; Thunder Bay; Rainy River; Patricia.

9. City of Toronto.

There are other lesser important changes in the Act dealing with Constitution of Council, election of officers, appointment of committees, etc., all of which are calculated to facilitate the functioning of the Council and the College.

In 1925, Sir William Mulock, Chief Justice of the Province of Ontario and now Chancellor of the University of Toronto, and the Honorable and Rev. Canon H. J. Cody, with a small group of associates, decided to establish a foundation in honour of the discovery of insulin by Dr. F. G. Banting. The campaign for funds met with gratifying response and subscriptions amounting to over half a million dollars were secured. The whole amount did not become available for a period of about four years, and the capital sum of the foundation has now grown to about $700,000.

Under the charter secured for the foundation, a part of the income is devoted to aiding in the maintenance of the Banting and Best Chair of Medical Research in the University of Toronto, while the remainder is disbursed in grants to workers in Canada who propose definite problems of medical research. The foundation has, during the past two years when it has been in receipt of its full income, aided in the researches of thirty-eight workers; and during the past year, in spite of the exercise of great care in the selection of the problems to be supported, the trustees have expended practically the whole of their annual income. There is little doubt that this foundation has contributed not a little to the development of medical research, especially in those medical schools in Canada which have the smallest incomes.

The Board of Trustees of the Banting Research Foundation, of which Sir Robert Falconer is Chairman and the two above-mentioned gentlemen are members, hope that the capital sum, the interest of which is at their disposal, will grow, as the work of the past two years has made it evident that a need exists for such a research fund as this in Canada.

The sixth annual lecture under the Donald C. Balfour Lectureship in Surgery at the University of Toronto was delivered in Convocation Hall on Tuesday, April 5, 1932, by Rudolph Matas, M.D., D.Sc., LL.D., F.R.C.S., Emeritus Professor of Surgery, Tulane University of Louisiana. The subject of Dr. Matas' address was ''The story of post-operative pulmonary embolism before and after Lister.''

Dr. William Waugh, bursar of the University of Western Ontario, and for 60 years a medical practitioner in London, was honoured by fellow doctors, by the city and by the university when he was tendered a banquet recently at the Hotel London.

Dr. Waugh was presented with the keys to the city and with an illuminated scroll by Mayor George Hayman on behalf of the citizens, among whom he has laboured for so long. Dr. James Bowman, who with Dr. Waugh, is a member of Western's first medical faculty, and Hon. Dr. Raymond Morand, M.P. (Essex East), were present, together with high officials of the university and medical men from every corner of Western Ontario.

Dr. Waugh retired from the teaching staff at Western ten years ago to become bursar. During his many years on the staff, hundreds of young men attended his classes, graduated and began the practice of medicine in Canada or abroad or joined the staffs of other universities. Many of these old students returned to London to pay tribute to their former professor.

Dr. Waugh graduated from the medical school of McGill University, Montreal, 60 years ago and it was to mark this event that the dinner was arranged.

The Theatre Night held by the Academy of Medicine, Toronto, for their library fund, netted them over $700.

Quebec

Montreal was fortunate in having a visit recently from Professor Lavier, of the Department of Parasitology, Universities of Paris and Lille, well known for his studies of trypanosomes. On April 2nd, Professor Lavier lectured before staff and students at the Bacteriological Department of McGill University on the subject of "Parasitic worms and cancer."

At the beginning of his remarks he referred to the so-called parasitic theory of cancer causation, based on bacteriological studies and the presence of cell-inclusions. These he regarded as having only a historical interest. He confined his attention to certain trematode and nematode worms which, he showed, were competent to produce cancer, at least in the sense that they incited tissue reactions which could, on occasion, become transformed into cancer. He spoke of the life history of certain of the liver and lung flukes and of the *Bilharzia hæmatobium, Bilh. mansoni,* and *Bilh. japonicum,* and also dealt with certain of the smaller cestodes. The lecture was illustrated by some very convincing microscopic slides and lantern views. The development of cancer in the liver, lung, urinary bladder and bowel was shown in early and late stages, and metastases were also demonstrated. The lecturer did not enter very far into explanations as to the exact part played by the grosser parasites in the etiology of tumours. His lecture was most interesting and instructive. The lecturer was introduced by Prof. E. G. D. Murray, Head of the Department of Bacteriology, and a vote of thanks was proposed by Prof. Horst Oertel.

Saskatchewan

Dr. R. G. Ferguson, of Fort Qu'Appelle, gave the Lister Oration at the April meeting of the Regina and District Medical Society. The Moose Jaw Medical Society were the guests of the evening. Dr. L. D. Croll, of Saskatoon, gave an address on the "Functional treatment of fractures," when he described the methods of Böhler of Germany. Doctor Bloomer of Moose Jaw presided at a round table discussion of medical problems.

Professor Alexander Galloway, of the department of anatomy at the University of Saskatchewan, sails at the end of April for South Africa. He has been appointed professor of anatomy at the University of Witwatersrand, Johannesburg. Doctor Galloway, who has been on the university staff for five years, was educated at the University of Aberdeen and occupied a post there before coming to Saskatoon.

LILLIAN A. CHASE

United States

The Study of University Teaching.—The American Association of University Professors has received a grant of $20,000 from the Carnegie Corporation and the Carnegie Corporation for the Advancement of Teaching to make a survey of the teaching now being done by college and university teachers in the hope that some constructive recommendations for the improvement of teaching methods may be the outcome.

Columbia University College of Physicians and Surgeons announces that, beginning in September, 1932, the minimum requirement for admission to the first year class will be attendance for three full years at an acceptable college of Arts and Sciences, which must at least include successful completion of courses required for the New York State medical students' certificates. Not all applicants meeting these requirements will necessarily be accepted, but their other qualifications for the practice of medicine will be appraised as well.

General

Letters, Notes and Queries.—Our Department of Health Education receives and answers a large number of inquiries each month. The majority of the correspondents are intelligent people, judging by the questions which they ask. The Department has its humorous side. Our readers will probably be interested in the following letter:—

"CANADIAN MEDICAL ASSOCIATION,

Dear Sirs,

Could you send me a chart of the human body, because I am a chiropractor (on human bodies), and I am a Professor of Calisthenics. I teach 500 pupils a year, so your advice would be useful to me as I carry on a continuous correspondence.

Permit me to ask you how to recognize hernia and appendicitis on a human body? May a boy of 17 years suffer from a heart lesion and inflammatory rheumatism at the same time? I fear to (next word illegible) their family doctor.

Yours truly,

Professor (*sic*) .....

(Sent by T. C. Routley, 184 College Street, Toronto)

Royal Canadian Army Medical Corps.—The following certificates have been granted: Capt. C. E. Cross, to be Major from date of November 5, 1931; Lieut. H. D. Bayne, to be Captain from date of November 6, 1931; Lieut. W. E. Hume, to be Captain from date of November 6, 1931.

GENERAL LIST.—Lieutenant-Colonel A. B. Walter is posted to command No. 14 Field Ambulance, with effect from August 18, 1931.

Homage to Dr. Charles Buizard.—Colleagues and friends of Dr. Charles Buizard, the General Secretary to the Surgeons' Society of Paris, have thought that, on the occasion of his promotion to the rank of Officer of the Legion of Honour, it would be fitting to present him, as a token of affection, with a bronze medal.

The members of the Committee beg all their colleagues to join in this testimonial to Dr. Charles Buizard, and to send in their subscriptions.

The execution of the medal has been entrusted to the well known artist, Turin, a "Grand Prix de Rome" for medal engraving.

Each subscriber of at least one hundred francs will receive a bronze replica of this medal which will be stamped by the French Mint.

Subscriptions should be sent to: MM. G. Doin and Co., 8, place de l'Odéon, Paris (6e).

Dr. Frederick R. Miller, Professor of Physiology at the University of Western Ontario, has been elected a Fellow of the Royal Society on the nomination of Sir Charles Sherrington, Professor of Physiology of Oxford University and Prof. A. B. Macallum, formerly Professor of Biochemistry of McGill University. This honour was bestowed upon Doctor Miller in recognition of his research work on the functions of the cerebellum. He has shown that this part of the brain influences muscle tone and is a factor in ataxia and incoordination.

Doctor Miller is a graduate of the University of Toronto and also holds the degree of M.D. (Munich). He was a member of the medical faculty at Toronto and McGill previous to his appointment as Professor of Physiology at Western in 1914.

Dr. J. A. Gray, Chown Research Professor of Physics in Queen's University, has been nominated for election as a Fellow of the Royal Society of London. Such an honour it is needless to say indicates that the recipient has attained high distinction in research in his own particular line. For some years Dr. Gray, an Australian by birth who came to Queens

from McGill, has been studying the properties of beta and gamma as well as x-rays in order to find something about the nature of matter and radiation. He was the first to show that beta rays excited secondary gamma rays (x-rays); that gamma and x-rays were of the same nature; that gamma and x-rays were modified in the scattering process, the rays becoming less penetrating the greater the angle of scattering. He discovered the effective wave length of the gamma rays of radium and he has found that beta rays lose energy on being scattered through large angles. These and other less notable contributions to the science mark Professor Gray as one of the outstanding physicists of the day.

Book Reviews

Imhotep to Harvey, Backgrounds of Medical History. C. N. B. Camac, M.D., Assistant Professor of Clinical Medicine, College of Physicians and Surgeons, Columbia University, New York. 324 pages. Price $3.75. Paul B. Hoeber Inc., New York, 1931.

To the growing list of interesting books on the history of medicine published by Hoeber has been added this sketch of the long period from Early Egyptian Medicine to the dawn of what we may call Modern Medicine, to the time of Harvey, which marks the merging of the Renaissance into the Modern Period. The author tells us the book is based upon notes prepared for seminars in medical history held in Columbia University for the students in the fourth year, while serving their six weeks' term of clinical clerkship in the Presbyterian Hospital. It is unusually free from medical biography, but aims to give a general view of the progress of medicine and of the outstanding advances made in various periods during the centuries under review. There is a summary statement of the philosophic and scientific achievements of the Greeks, the Romans and of the different schools of the Middle Ages. There is a short outline of the schools of thought which marked various periods in medicine. With each chapter appears a list of the outstanding writers and teachers, the chief scientific pursuits and medical practices of the period under discussion. Some forty pages are devoted to historical records and quotations from various sources, such as the discovery of the pulmonary circulation by Servetus, the discovery of the circulation of the blood by Harvey, the abjuration of Galileo, and the terrible Jewish anathema pronounced upon Spinoza. A list of books which deal with the subjects discussed in each chapter is appended.

The Story of Medicine. Victor Robinson, M.D., Professor of the History of Medicine, Temple University School of Medicine, Philadelphia. VIII and 527 pp. Price $5.00. Albert and Charles Boni, New York, 1931.

This book, well printed, and of pleasing appearance, has, clearly, been written by one who is master of his subject. The history of medicine, for so long neglected, seems at last to be coming into its own, judging from the not inconsiderable number of books on the subject that have appeared within the last two or three years. That so many should be constrained to write on the history of medicine in its various phases is significant and of happy augury.

Professor Robinson's book is different from most. Far from being an exhaustive, and, therefore, a somewhat prolix, account of the development of medicine, it touches the "high spots" and touches them, withal, lightly. The result is a very readable, and yet, for most people, an adequate presentment of the subject. Beginning with the Stone Age the story is brought up to date; the social life of the various periods is portrayed with insight and incisive diction, lightened at times with sardonic humour; sufficient biographical data are given to frame out the story; and numerous quotations, both medical and otherwise, add the human quality. We are made to realize that the development of the art and science of medicine is best taught when it is considered along with other aspects of human progress, and in the light of human limitations and of human vagaries. Much learning has made possible this book; the *materiel* is well selected; the exposition, skillful; and the style, excellent. We have read few books of the kind that have given us more instruction and in so pleasing a manner. We are told that the book was written for the public, but medical men would be well advised to read it. It has an appeal to all who are fond of their craft and take an interest in literature and history.

Operative Dental Surgery. J. B. Parfitt, L.R.C.P., M.R.C.S., L.D.S., Consulting Dental Surgeon and late Lecturer on Operative Dental Surgery at Dental School of Guy's Hospital. Third edition. 406 pages, illustrated. Price 21/- net. London, Edward Arnold & Co., 1931.

This is a practical and fairly compact hand-book of accepted conservative dental practice, wherein the author is careful to give credit to former writers and inventors. There are several interesting suggestions of Continental methods and materials which are not generally known or used here. In the chapter on the "Onset and Growth of Dental Caries" the author very neatly describes the present day belief "that teeth are not passive and dead lumps of matter but living parts of a living organism, and as such share to some extent in the vicissitudes of its changing metabolism."

The author sets out to give a summary of modern technical methods. This objective has been achieved.

Prohibiting Minds and the Present Social and Economic Crisis. Stewart Paton, M.D., Lecturer on Psychiatry, Johns Hopkins University, Baltimore. 198 pages, price $2.00. Paul B. Hoeber, New York, 1932.

This is a book primarily intended for physicians but equally interesting and enlightening to the serious minded among the laity. As in his earlier book, "Signs of Sanity", Doctor Paton continues his onslaught on certain features of modern life—more particularly American life—that thoroughly irritate and exasperate him. The present volume will have a more direct appeal to American readers since his attack is to a large extent directed against the type of prohibition uppermost in most people's minds. This is not the only vagary dealt with, however. The author finds many opportunities to make thoughtful and thought provoking statements on other forms of "Prohibitionism" and other pertinent topics.

Doctor Paton might have taken as his text that bit of the wisdom of age passed to youth, "Be not righteous overmuch; why shouldst thou destroy thyself?" for he is quite satisfied that the unfortunate choice of "Don'ts" leads inevitably to a great many disabilities both in individual personalities and in the body politic—among them fear, flabbiness, self-distrust. Long ago, President Elliott insisted that only in presence of the possibility of doing wrong, could the will to do right be strengthened. The United States was founded by a group who fled from the prison of conformity in the Old World. They promptly set about building new jails for themselves in the New and their descendants, direct and adopted, have been at it ever since. Doctor Paton's argument is to the effect that with much talk of liberty, its actual meaning has been lost.

Among remedies suggested the author feels that there must be first and foremost a much more deliberate and intensive effort to understand and direct human nature than there ever has been. Prohibitions of any kind can only mean an acceptance of failure in this. Rampant emotion has been at the bottom of most of the world's unhappy and distressful periods. Happiness and joy of living have been smothered in excessive fighting of sin and remorse. Recovery can come only from understanding and a restoration of confidence and courage in the ability to find reasonable solutions for personal problems. In this process the part of the intelligent and properly trained physician must be evident to all. The ground can very well be prepared by the type of all around body-mind education set forth in the earlier book "Education in War and Peace".

There is a certain amount of repetition of ideas and phrasing that is a bit tedious, but for the American public to whom the book is chiefly directed, it is a very fair argument for St. Augustine's centuries' old pronouncement "For the effort to make men abandon even a great evil and cleave to a great good, produces more trouble than benefit if they act merely under compulsion and not from conviction."

Wheeler and Jack's Handbook of Medicine. Revised by John Henderson, M.D., F.R.E.P.S. (Glas.), Physician, Glasgow Royal Infirmary. Ninth edition. 654 pages. Price $3.50. E, & S. Livingstone, Edinburgh; Macmillan Co. of Canada, Toronto, 1932.

There is a special interest attaching to books which have survived over a period of years. In the case of "Wheeler and Jack" this period is nearly thirty years, and the temptation to compare the early editions with this the most recent one is very great, reminding us as it does of the fascinating growth of our knowledge in that time. Such a comparison of course is not within the duty of a reviewer; he will only remark that the manner in which this edition has managed to keep pace with this growth, and yet to remain within the limits which form one of the advantages of the book, is in itself worthy of high praise. Both the original editors are dead, but their names are retained as an integral part of the book. The editing, which is now done by Dr. John Henderson, carries on the style of writing and arrangement in complete accord with the original scheme of the book. It will find a lasting place in the list of books for student and practitioner.

Selected Writings of John Hughlings Jackson, Vol. 2. Edited by James Taylor, assisted by Gordon Holmes and F. M. R. Walshe. 510 pages. Price 25/-. Hodder & Stoughton, London, 1932.

Volume I of these selections from the writings of Hughlings Jackson has already been enthusiastically received. It contained the writings on epilepsy and allied conditions. The present volume presents Jackson's views on the evolution and dissolution of the nervous system and on speech, together with a variety of papers, addresses and lectures on neurological subjects. It would be quite impossible to give an adequate review of this volume in the limited space available. One must record unstinted praise for the editors who have so splendidly selected from the multitudinous writings of Jackson those of outstanding value and importance. From 1861 to 1909 he published no less than 319 articles—case reports, formal lectures, summaries of knowledge to date, etc. Throughout it all it is quite evident that, whilst thoroughly generous toward the theories and work of others, he was at all times prepared to withstand attacks on his own. Repeatedly, one notes evidence of his dealing with criticism or his actual forestalling of it.

Though centring his great effort on the problems of neurology, Jackson never lost sight of its relationship with general medicine. All of his best work was done in general hospitals, where he was considered, above all else, a physician, and, as such, was alert, observant, quick thinking, but careful in deduction. "Confidence," he says, "is not always a sign of sagacity, but may result because we have not made numerous post-mortem examinations." Philosopher that he was, he never misses an opportunity to pass on from the mere recording of clinical facts and observations to the most astute theorizing as to causes and relationships. "From this point," as he remarks, "let me again urge students who wish to make cases things to think from to avoid the too free use of technicalities and to study one case by the light of many." There is little doubt that here lies the explanation of the astounding accuracy of many of his theories. Yet he knew the limits of philosophizing, and kept in their proper place those "metaphysical explanations which in one sense explain everything, but really explain nothing."

It is inevitable that to many some of the contents of this volume will seem trite and not worth reprinting, but, as the editors point out, the status of this material was quite different at time of publication. It represented vigorous original thinking and exploration and hence merits preservation. Neither is it surprising that some of the theories advanced, *e.g.*, that of the so-called cerebellar seizures in cases of posterior fossa tumour, should have since proved incorrect. The marvel is that he was so seldom wrong.

This second volume, like the first, will be received with gratitude by neurologists the world over—a mine of information but better still, the delineation of the working of a truly great mind.

Intracranial Tumours. Harvey Cushing, Professor of Surgery, Harvard Medical School. 150 pages, illustrated. Price $5.00 postpaid. Charles C. Thomas, Springfield, Ill. and Baltimore, Md., 1932.

In this monograph Professor Cushing gives a summary survey of the two thousand verified cranial tumours which have passed through his clinic. In the introductory paragraphs, reminiscent in character, the author enlarges briefly upon the growth of neurosurgery, contrasting present day methods with those of thirty years ago. For practical purposes three primary case subdivisions are defined: (1) tumour suspects; (2) tumours histologically unverified; (3) tumours histologically verified. A table shows the percentage incidence of the verified tumours.

The succeeding chapters are devoted to a consideration of eleven tumour groups with a final explanatory section upon operative statistics in general especially as applied to intracranial surgery, together with a general summary including tables of mortality percentages for the present series, (1) as a whole, (2) year by year, and (3) for the separate tumour groups. Factors which influence mortality statistics and points which have made it possible to reduce the operative mortality are briefly discussed in conclusion.

In each section the author has enumerated the operative and case mortality statistics for the various tumour groups and subdivisoins, together with their incidence. He has skilfully clothed these data with concise, instructive paragraphs concerning pertinent points from his own experience in the matter of surgical procedure, together with reference to x-ray therapy, the biological peculiarities of the tumours, their sites of predilection, and case report summaries to illustrate symptomatology and operative results. He emphasizes the value of electro-surgery and stresses the value of the supravital method for rapid histological diagnosis. Throughout, the dependence of a successful surgical procedure upon an accurate knowledge of the biobehaviour and nature of the tumour attacked is em-

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"Subminimal diets which fall just short of adequacy may, without producing outspoken disease, lead to chronic gastritis and enteritis with impairment of neuromuscular control of the intestine. Indeed there is good reason for believing that chronic vitamin B deficiency of this character is responsible for many of the obscure, indefinite digestive disorders—disorders which so often destroy the happiness of the patient and baffle the physician. We are accustomed to call these patients neurasthenics and chronic intestinal invalids, whereas many of them are sorely in need of food of the proper vitamin content. In addition, it is possible that many nervous disorders, particularly of the so-called 'functional type', result from a failure of the diet to provide vitamin B in sufficient amount."—JAMES S. McLESTER, Professor of Medicine, University of Alabama. ("Nutrition and Diet in Health and Disease." Second Edition, 1931, page 324.)

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phasized. In this way the monograph, which is not intended as a text-book, is of value not merely as a statistical summary of a vast number of cases but also as a brief but lucid outline of the more vital points concerned in the accomplishment of brain tumour surgery. The book is well illustrated and is written in the author's usual clear and attractive style. The work of the publisher is excellent.

Intracranial Pyogenic Diseases. A. Logan Turner, M.D., LL.D., Hon. F.R.C.P., Consulting Surgeon, Ear and Throat Dept., Royal Infirmary of Edinburgh, and F. Esmond Reynolds, M.D., D.T.M. and H.M.R.C.P., Superintendent of Laboratory of Scottish Asylums' Scheme, Edinburgh. 271 pages, illustrated. Price 12/6 net. Oliver & Boyd, Edinburgh and London, 1931.

This excellent book is a pathological and clinical study of cases illustrating the pathways of infection from the face, the nasal and paranasal air cavities. The investigation extended over a period of nine years; in many of the cases a large part of the floor of the skull was removed at necropsy and serial sections were cut illustrating the spread of infection in the air sinuses, orbits, cavernous sinuses, bone, meninges and brain. The correct interpretation of many of the microscopic slides was often difficult and required careful consideration of the clinical aspects of the cases and the book is a demonstration of what may be accomplished by a clinician and pathologist working together.

Fifty-five cases were studied. In 21 the spread of infection was by way of the venous blood stream or bone to the cavernous blood sinus. An excellent anatomical description of this sinus and its venous connections enables one to understand the widespread extension of infection to adjacent structures, which usually results finally in a fatal meningitis. The clinical signs of cavernous sinus thrombosis are carefully considered and it is clearly demonstrated that proptosis and choked discs only appear when the thrombosis has extended into the orbital cavity itself.

In the last chapter a discussion on the incidence of intracranial and blood infection following operation upon the paranasal air sinuses is of great interest and importance. It has been said that operation upon the air cavities may prove a greater source of danger to the patients than the condition from which he is suffering. The figures collected in this book suggest that spontaneous intracranial infection and post-operative intracranial infection each develop in from 1 to 2 per cent of cases. The reader is left feeling that it must be a very difficult problem to decide whether an operation should or should not be performed. The authors have pointed out the difficulty of obtaining reliable figures, and also of deciding in any given case as to whether the operation caused the intracranial complication. The book should prove a great stimulus to the accumulation of accurate clinical and post-mortem records. It is only by keeping an accurate "score" that definite information rather than impressions can be handed on.

Because of the carefully worked up cases which this book contains it will become a classic and will be referred to whenever the subject of intracranial infection secondary to infection about the face and nasal air cavities is discussed.

Fundamentals of Orthopædic Surgery in General Medicine and Surgery (Harvard Lectures). Robert B. Osgood, M.D., F.A.C.S., Prof. Emeritus of Orthopædic Surgery, Harvard Medical School and Nathaniel Allison, M.D., F.A.C.S., Professor of Surgery, University of Chicago. 311 pages. Price $3.75. Macmillan Co., New York; Macmillan Co. of Canada, Toronto, 1931.

This volume has been prepared in connection with the work of the class in orthopædic surgery at Harvard Medical School. A mimeographed copy of an "exercise" was given to the class and the hour of instruction in the succeeding week was utilized for amplification, and for discussion. After six years of experience, the authors are of the opinion that the system they have used has distinct merits. This book is the outcome of the experiment. The subject matter is accordingly not presented for the specialist in orthopædic surgery; it is prepared for the undergraduate and for the general practitioner. No details are given of operative work, and throughout the volume an attempt has been made to present fundamentals rather than minutiæ. On the whole, this object has been well achieved.

The book is divided into twelve chapters. The first three deal with general joint phenomena; the reactions of developmental and adult bone, and its response to infection; and the changes in bones and joints resulting from nutritional and growth disturbances. One notes that in this important section, there is no mention of the action of phosphatase, and only a passing reference to the function of the parathyroids. Separate chapters are devoted to congenital deformities, tuberculosis, anterior poliomyelitis, and scoliosis. As might be expected, these subjects are handled with conservative commonsense. Another section presents a rather sketchy outline of cerebral and spastic palsy, obstetrical paralysis, Volkmann's deformity, and Dupuytren's contracture. A concise summary is presented of the present state of knowledge in regard to chronic rheumatic arthritis. As showing the trend of events, a section is given over to the relation of orthopædic surgery to industry. In this chapter, a plea is made that "all fractures and dislocations are potentially crippling, and should be handled from start to finish only by surgeons trained and interested in their management," a plea which we endorse most heartily. The concluding chapter is perhaps the least satisfactory. It is entitled "Body Mechanics and Statics." After an excellent review of the importance of posture in the maintenance of health, a lengthy discussion of the mechanics of the foot follows. This consists mainly of platitudes regarding the "arches" of the foot. It is surely time that orthopædic surgeons realized that the foot is an organ designed for locomotion, and that the kinetic equivalent of the arch is the spring.

While differences of opinion must always exist, we fancy that few surgeons of experience will agree with the authors that in the case of the fixed elbow, "for most purposes a position of right-angled flexion is the best," or that full extension at the knee joint is desirable even to male adults "who stand or walk at their labour." The misprints are numerous. "Palpitation" for "Palpation" is repeated on successive pages. The last paragraph in the book refers to "physic factors" instead of "psychic". Nor is the syntax beyond reproach. On page 48, two clumsy split infinitives occur within eight lines of one another. On page 12 the journalistic solecism "mitigate against" strikes the eye, while the references to the "well limb" are numerous. These are all points which are capable of easy correction, and detract but little from the sterling value of the book.

Surgical Errors and Safeguards. Max Thorek, M.D., Surgeon-in-Chief American Hospital, Chicago. 696 pages, illustrated. Price $11.00. J. B. Lippincott, Philadelphia, Montreal and London, 1932.

There are few publications in English upon the dangers and failures of surgical practice, although frank discussions of these matters have been common in foreign countries. In our literature it is true that much more is heard of successes achieved, catastrophes averted, and dangers overcome. The distress of accidents and the bitterness of failures have not been brought to the fore, perhaps a sign of scientific immaturity. It is greatly to Dr. Thorek's credit that, with his abundant experience and retentive memory,

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he has combined a willingness to be of help to others, even though such a course requires the exposition of his own fears, occasional uncertainties and misgivings, and even failures. He has written a large book upon the errors and dangers of surgical practice. The safeguards that he suggests may be summarized as detailed technical knowledge, scrupulous thoroughness, and the shrewdness that comes from a broad human experience.

The work is arranged in regional sequence and covers practically the whole of general surgery. Although it does not answer every question that can arise in practice, its scope appears surprisingly broad when it is remembered that most of the material comes from the experience of one man in relatively few years. In choosing the type important material has been printed in such a way as to catch the eye, an arrangement useful and practical. The style is helpfully dogmatic. Dr. Thorek thoroughly condemns procedures which he finds faulty (such as the injection treatment for varicose veins), and although it is difficult to select any one subject for special approval, the chapters on abdominal surgery should be mentioned as outstanding.

This is a book for the thoughtful surgeon who is willing and able to learn from the experience of others, and who can accept kindly advice and stern warning for his own lasting benefit.

Surgery of the Chest. Geo. F. Straub, M. D., F.A.C.S. 475 pages, illustrated. Price $10.50. Chas. C. Thomas, Springfield, Ill., and Baltimore, Md., 1932.

Dr. Straub's chief aim in preparing this volume was the creation of greater interest in problems of thoracic surgery, and it would be impossible to read the book that he has written without experiencing in some degree the enthusiasm with which he regards his subject. The work is essentially a compilation covering the development of thoracic surgery in the past twenty-five years. It is arranged according to systems and the approach is generally historical. The abundant illustrations are splendid examples of graphic exposition, and the majority of the excellent drawings have been done personally by the author. The reproduction of the figures and the printing are models of what a good surgical book should contain. It is perhaps to be regretted that the author was not more ambitious in the scope and aim of this book. With such a sound general outline of the subject as a basis, the addition of material on pathology, physiology and bibliographical data, and the abbreviation of material which has only historical interest, the work would take its place as a nucleus for an authoritative text-book in the English language on this very pertinent subject.

Clinical Roentgen Pathology of Thoracic Lesions. William H. Meyer, M.D., Professor of Roentgenology in New York Post-Graduate Medical School of Columbia University. 261 pages, illustrated. Price $6.00. Lea & Febiger, Phila., 1932.

The preface states that this book records in concise and condensed form the subject matter of a course in roentgenology: this it does. In the process of condensation, however, the work becomes merely a summary of a didactic course and would seem to be of value only to the student who wishes a passing roentgenological knowledge of every conceivable abnormality within the thorax. All possible structures and diseases with their alteration of the roentgen picture are covered most systematically and briefly, avoiding detail and discussion. Technique is touched upon in relation to error and advantages arising therefrom. It is not a book for the technician. The pathological basis of changes in illumination is adhered to throughout. The section on tuberculosis is sanely written, with full appreciation of the importance of clinical correlation. Lack of comprehensive consideration of any one subject excludes the use of this as a reference book. The writing shows slovenliness in the use of such expressions as, "it is up to the roentgenologist," "aortic regurge", etc. The book is well printed and well bound, completely indexed, with excellent reproductions of a large number of roentgenograms. No bibliography.

Recent Advances in Allergy. G. W. Bray, M.B., Ch.M., Asthma Research Scholar, Hospital for Sick Children, London. 432 pages, illustrated. Price 12s. 6d. J. & A. Churchill, London, 1931.

The authors of the various volumes of the "Recent Advances" series have in each case possessed special qualifications for their writing. There has not been a more suitable choice as to author than in the present volume. Dr. Bray is carrying on research in asthma continually, and has a long record of work behind him. Thus equipped he has produced a work which is of outstanding merit. There is no condition which the general practitioner encounters more frequently than asthma, and nothing on which guidance is more welcome, since the developments in our knowledge have been so rapid and numerous. Dr. Bray has managed to condense and clarify the mass of literature which has accumulated, in an unusually satisfactory manner. There is no doubt that much of the literature on asthma is repetition, both of facts and theory, and the necessity for some such attempt to indicate the more permanent elements of our knowledge is very great.

The book is divided into two parts; part one deals with allergy in general, and part two with the individual manifestations of allergy. The chapters on the changes in the blood and the biochemical aspects are particularly interesting. The heartiest commendation is due Dr. Bray for his excellent survey of this important subject.

Body Mechanics, Education and Practice. Report of the Subcommittee on Orthopædics and Body Mechanics, Robert B. Osgood, M.D., Chairman of the White House Conference on Child Health and Protection. 164 pages. Price $1.50. Century Co., New York and London, 1931.

This book is a concise summary of proved details relative to the importance of good body mechanics in children and not a text-book nor a comprehensive appraisal of body mechanics. The work includes two valuable appendices, "Posture and Physical Fitness", which is a report on the Chelsea School survey, quite the most exhaustive and important work on posture or body mechanics, which has been so far carried out, also a reprint of the course in physical education for the Day Elementary and Day Intermediate Boston Public Schools, which is an illustrated manual of body mechanics with carefully worked out descriptions of games and detailed exercises for the maintenance of good posture and the correction of poor posture.

The report is conservative and portrays the modesty characteristic of Doctor Osgood and his work.

BOOKS RECEIVED

Therapie der Erkrankungen des Vegetativen Nervensystem; Vorträge gehalten in Bad Oeynhausen. 96 pages. Price $1.60. Theodor Steinkropff, Dresden and Leipzig, 1930.

Handbook of Sanitary Law for Use of Candidates for Public Health Qualifications. B. Burnett Ham, M.D., D.P.H., Fellow of Royal Sanitary Institute. Eleventh edition, 366 pages. Price 7/6 net. H. K. Lewis, London, 1931.

Common Pests. Rennie W. Doane, Professor of Zoology, Stanford University. 384 pages, index, illustrated. Price $4.00. Charles C. Thomas, Springfield, Ill., and Baltimore, Md., 1931.

Reclaiming the Drinker. Charles B. Towns. 77 pages. Barnes & Co., New York, 1931.